THE IRON TRADE REVIEW

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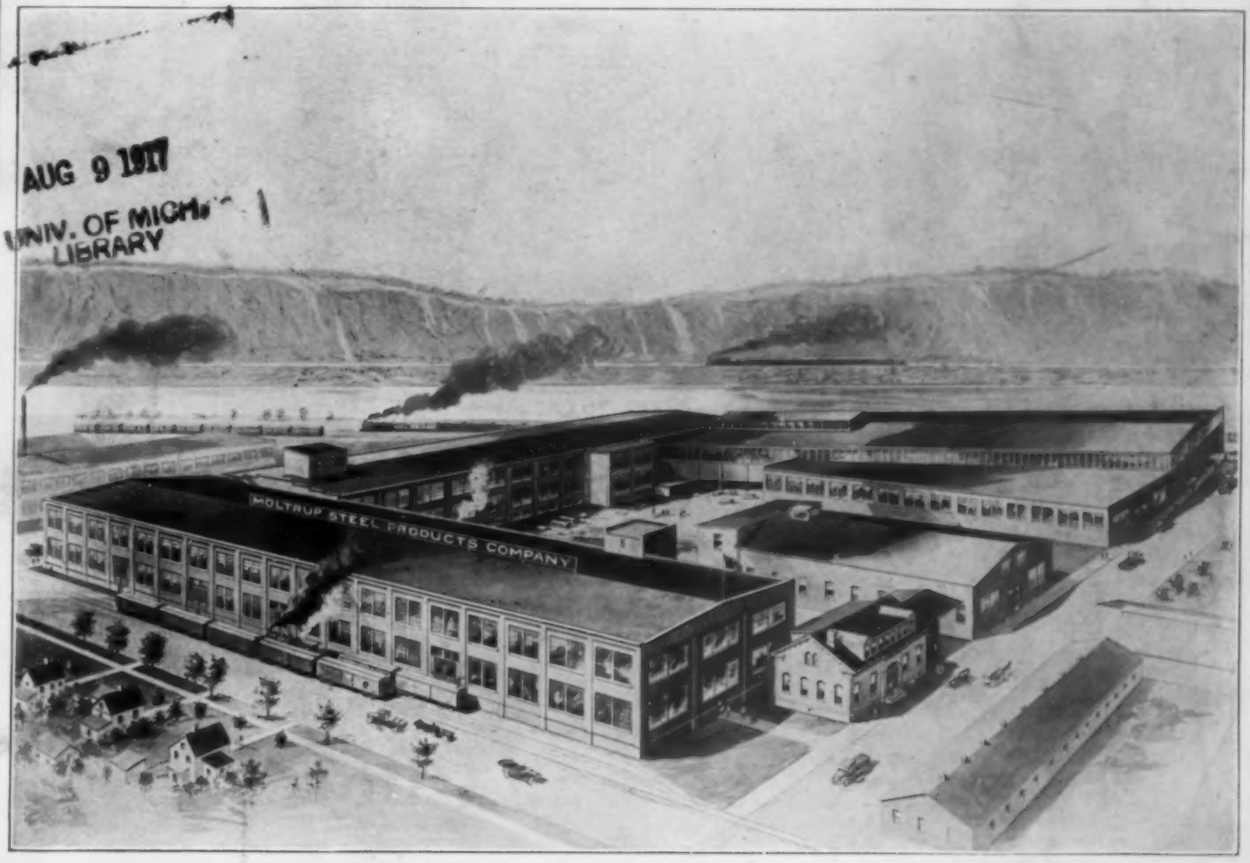

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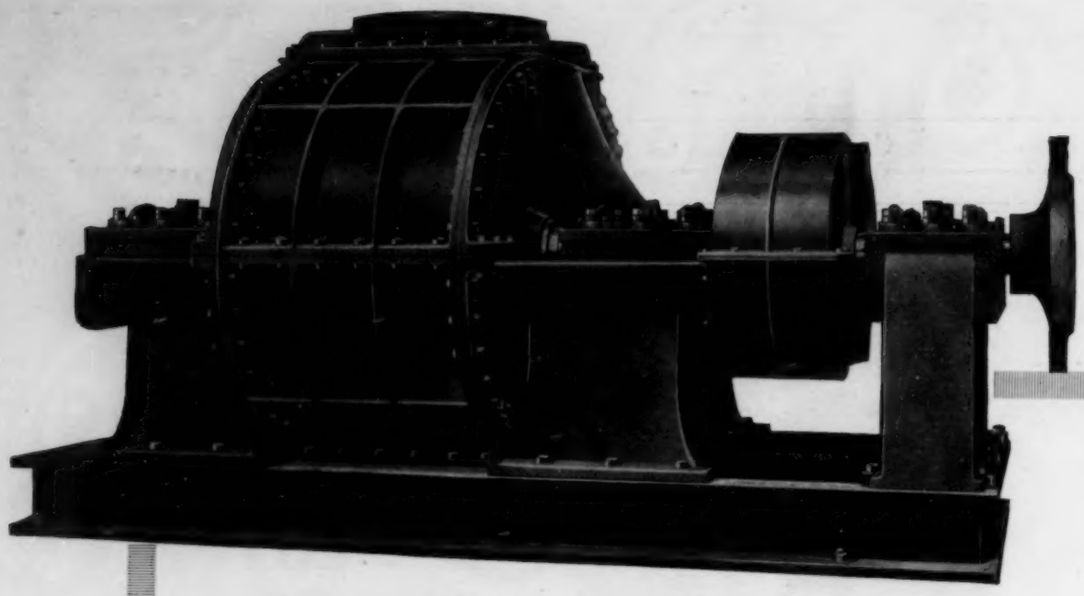
Advertisers' Index, page 120. Contents, page 47. "Where-to-Buy," page 56.
Engineering Directory, page 94. Classified Advertisements, pages 103-119.



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NEW YORK
114 Liberty Street

THE IRON TRADE REVIEW

Vol. LXI Cleveland, August 9, 1917 *No. 6*

Government Adds to Steel Control

New Export Embargo Gives Tighter Rein on All Foreign Shipments Including Those to Allies—Conditions in Foreign Trade Complicated and Cause Speculation—Little Open Buying

EACH fresh war move at Washington affecting iron and steel, continues to add to the extending government domination of the industry and narrows the tonnage left to open buying. The embargo announced this week by President Wilson restricting to war purposes all foreign shipments of pig iron, plates, scrap and billets, accounts for a large part of the approximately 20 per cent of the country's iron and steel output which has been going abroad. By limiting licenses in these lines to product already manufactured, the government likewise is taking a more complete hold on the distribution of supplies as well as on new buying for the allies. Whatever political significance this may have with regard to the large purchases of ship steel and other materials by Japan still to be shipped, is secondary to the fact that the government apparently proposes to fully realize its strategic advantage through its hold on the nation's output of iron and steel. In this direction, the President is urging greater speed by the federal trade commission to fix production costs in order that price policies finally may be adopted both in behalf of itself and of its allies. The delay in the trade commission's report is ascribed to the difficulties of squaring the sharp variations in costs among individual iron and steel manufacturers.

July Shows Mixed Record

July's record in iron ore shipments and pig iron production was both encouraging and discouraging. The lake fleet moved 10,250,000 tons of Lake Superior ore, the best record ever made in any month. The decline in shipments up to Aug. 1 is now less than 3,000,000 tons when compared with last year. The goal of 60,000,000 tons for the season seems assured. On the other hand, pig iron production fell off during July. The decline was less than 1 per cent, but marked a continuance of the drop which began in May. The July production was 3,337,442 tons. Weather conditions and coke shortages were responsible. Various stacks continue out of commission due to these causes. In the south the effect of a possible coal strike on production is causing apprehension.

Of all the government's major war efforts and their equivalent of great tonnages of steel the tremendous outlay for the handling and maintenance of American troops in France is coming in for principal attention. A series of correlated construction enterprises stretching from the battle line back to this country is in view. The large tonnage of rails bought a week ago represents only one phase of the program and this is to be followed by purchases in other steel lines on a comparable scale of magnitude. France is in the market on its own account for a large number of cars.

Export Iron is Tied Up

The pig iron market faces a new complication as a result of the further restrictions on export shipments. Producers and consumers are speculating as to the market effects of the large unshipped tonnage for foreign consumers, which has accumulated at tidewater points awaiting license and vessels. It is estimated that 40,000 tons are at gulf ports alone. Japan has a heavy tonnage on maker's books at present. The pig iron market virtually is marking time. New buying is light, but consumptive demands are very heavy and insistent. An inquiry for 5000 to 7000 tons of basic for a New Jersey consumer is current. Prices have been little altered by the week's developments and further easiness is not apparent, although one small sale of basic at $52, valley, is reported. Both buyers and sellers seem disposed to let the market gradually adjust itself to the new conditions.

Labor and car shortages again have turned spot coke upward and $14 was paid in the week for furnace fuel, an advance of $4. The drop in the average car supply to 55 per cent is attributed to the efforts of the railroads to speed up the backward movement of coal to the northwest. Labor conditions in the coke fields have been the most unsatisfactory in many weeks.

The Iron Trade Review

EDITORIAL

Prolonged Uncertainty Hurts Industry

PRIORITY is another problem which lends to the uncertainty prevailing in all industry. It barely seems possible that the exigencies of war will permit of the writing of a preferred list, but it is palpably evident that judicious priority must be established and maintained by those equally familiar with the resources of the industries and the comparative timeliness of the materials of war. The question does not concern the common sense necessary to differentiate between the preference to be given production and shipments of a tonnage of steel for a moving picture palace and one for war vessels; the point is that so long as there is no law guaranteeing priority for military requirements in the field of production, there is a gap in our war arrangements which must be stopped temporarily by the patriotic efforts of the industries themselves.

So far, our productive organization has responded most commendably, from a military standpoint, to the needs of the army and naval programs. In fact, it has responded so completely that it has aggravated the already semi-paralytic conditions of general industrial enterprises. Priority of necessity entails an industrial revolution to a greater or lesser degree, but it is scarcely fair to the loyal manufacturers to prolong indecisiveness any longer than it requires to organize governmental authority for war. The situation will not be ameliorated until authority is properly centralized to command priority in the production and transportation of goods essential to the prosecution of the war. Business interests expect to undergo a reorganization for the period of the war; it is not this that is causing complaint or a weakening industrial structure, but it is the prolonged uncertainty which precludes progress on any definite programs of adjustment.

Sixteen Turns Are Sufficient

WHEN the United States entered the war, official Washington expressed the belief that it would be necessary to drive rolling mills seven days a week in order to meet demands for military necessities. The industrial resources of this country have not yet been severely tested by the nation and its allies, but it already is apparent that our blast furnaces, steel works, finishing mills and machine shops will experience no difficulty in supplying material needed to prosecute the war successfully. Moreover, this can be done without disturbing present working conditions to any great extent.

Tin plate manufacturers received one of the first calls to co-operate with the council of national defense. They were asked to expedite the movement of material entering the manufacture of containers for perishable food stuffs. Federal officials declared that tin plate makers could not cope with the abnormal situation caused by the war, unless mills operated 17 turns, instead of 16 turns, a week. Leaders of the industry were requested to offer suggestions for obtaining relief, if possible. After mobilizing the resources of the tin plate trade, the sub-committee on tin plate of the American Iron and Steel Institute announced that perishable food packers will obtain all the tin plate they require. In addition, it is pointed out that this country will be able to ship huge tonnages of tin plate to our allies, thus relieving pressure for steel in England and France.

Mill managers generally believe it would jeopardize the interests of the nation to attempt to increase production by operating finishing mills seven days a week. During the extremely hot weather recently, the output of rolling mills was reduced from 10 to 20 per cent. Many sheet and tin plate mills were made idle by the intense heat; if these mills had been operating 17 turns, instead of 16, it is likely that many men would have been prostrated. Rolling mill employes have been working under high tension for more than two years. The time has not yet arrived when it is necessary to call upon them to assume greater physical burdens.

Let Labor Banish the Slackers

ABOUT two years ago, union iron molders in one of the larger manufacturing centers of the country went on a strike. According to business agents of the union, the strike continues to exist. It is not likely that it ever will be ended formally by union officials. However, virtually every man affected by the strike order returned to work many months ago, either having reported for duty at his old post or having accepted work in some other shop under identically the same conditions as those existing before the walk-out took place. The strike, it must be admitted, proved to be a fizzle.

Undoubtedly, it would have been forgotten by this time if it were not for an advertisement that appeared recently in the technical press. The copy for the advertisement was prepared by a company which purchased at a receiver's sale the plant and complete equipment of a foundry interest whose molders walked out principally because labor union leaders told them they should receive not less than nine hours' pay for eight hours' work. The foundry had struggled through the serious depression experienced in this country

EDITORIAL

in 1914 and 1915, and had just about recovered from the industrial disturbance caused by the outbreak of the war in Europe, when its shops were made idle by the molders' strike. Satisfactory arrangements for sub-letting contracts could not be made. Before molders decided to return to work, the financial resources of the company had been depleted.

The attitude of organized labor toward the interests of manufacturers apparently has not changed greatly since this country became involved in the struggle for democracy. Nothing further need be said about the disgraceful riots in East St. Louis. Several tin plate mills, furnishing material for the conservation of perishable food crops, have been made idle recently by labor union leaders. Labor trouble of every kind at this time calls for the harshest condemnation. It should be impressed upon employes in all branches of industry that their services are required to win the war just as much as the men who are about to take their places in the trenches in Europe. They should be made to see they are fighting for themselves, for their future security and for the right to live as free men. There is no more room for slackers or malcontents in the industrial army than among those who will carry the national colors to the firing line.

Industry Meets the Supreme Test

OFFICIAL announcement made by Secretary of War Newton D. Baker that American guns from the 3-inch size up to the heaviest mobile artillery will be issued to American troops in France is gratifying. This statement has been made necessary as the result of the entirely erroneous declaration by the so-called committee on public information that American armies in Europe are to be supplied with large field guns from French gun factories. While, as the committee statement said, the supply of field artillery has been wholly inadequate, it is nevertheless a fact that remarkable progress has been made in creating private capacity for this character of manufacture. In fact, the tremendous task of building up the required facilities for large artillery production has proceeded so well that this equipment will be supplied from various United States plants for use in the immediate future. It is not likely that the expansion of these facilities will have grown so much that it will altogether obviate the necessity of having a certain amount of artillery finished in French plants using forgings shipped from America. General Pershing's division, it is probable, will be assigned to the work of having some artillery finished in French plants. But it will not be far distant until the entire output will come from American plants, some of which now exist and are being expanded, while others are to be built and equipped.

The nation has source for real gratification that so many plants have been able to build up a capacity and personal skill for munition and ordnance manufacture as the result of orders from European belligerents. Three years of foreign war orders have done more for the course of real preparedness than 25 of niggardly appropriations for common defense by an unwilling congress.

English Versus American Preparedness

THE success with which England has transformed its immense industries from a peace to a war basis in less than 36 months is forcibly expressed in the article appearing on page 295 of this issue entitled, "British Control of Iron and Steel in War," by J. Horton, Birmingham, Eng., associate editor of THE IRON TRADE REVIEW.

The wonderful fighting spirit which has characterized the British nation from the beginning of its existence has reasserted itself, with the result that "teamwork and industrialism have entered into the very fiber of British government." Despite the fact that labor is scarce and much of it unskilled, that many blast furnace stacks are out of commission, and others are in danger of collapse owing to the enormous strain imposed by long periods of uninterrupted blowing, the annual output of steel is at present 10,000,000 tons as against 7,000,000 tons before the war.

At least one conclusion can be drawn from these figures. By a united and concentrated effort on the part of its people, England has greatly amplified its production in the face of huge obstacles. That government control was the medium through which it was accomplished expresses little; the fundamental fact is that industry as a whole backed the nation.

The sacrifices which war will force on America yet are not clearly defined. In England maximum prices have been established. When it is considered that the American steel output is over four times that of Great Britain, it is doubtful whether such regulation will be found necessary or practical in this country. The American manufacturer, however, already has proved his willingness to subordinate his personal advantages in order to promote ultimate success in this war. The uncertainty which the future holds is brightened by the knowledge that the nation, industrially, will continue to place every available facility at the government's disposal.

Iron and Steel Prices

Corrected to Wednesday Noon

SCRAP, WAREHOUSE AND IRON ORE PRICES ON PAGE 318

PIG IRON

(Delivery this year.)

Bessemer valley	$55.00
Bessemer, Pittsburgh	55.95
Basic, Pittsburgh	52.95
Basic, eastern Pa.	50.00 to 52.00
Basic, Buffalo	54.00 to 55.00
Malleable, Pittsburgh	55.95
Malleable foundry, Chicago	55.00
Malleable foundry, Phila.	56.00 to 58.00
Malleable foundry, Buffalo	54.00 to 55.00
No. 1X, Phila.	55.50 to 57.50
No. 2 foundry, Pittsburgh	55.95
No. 2 foundry, Cleveland	55.00
No. 2 foundry, Ironton	55.00
No. 1 foundry, Chicago	56.00
No. 2 foundry, Chicago	55.00
No. 2X foundry, Phila.	53.00 to 55.00
No. 2X foundry, N. J. tide	53.00 to 55.00
No. 2X foundry, Buffalo	53.00 to 55.00
No. 2 plain, Philadelphia	52.50 to 54.50
No. 2 plain, N. J. tide	52.50 to 54.50
No. 2 plain, Buffalo	52.00 to 54.00
No. 2 southern, Birmingham	46.00 to 48.00
No. 2 southern, Cincinnati	48.90 to 50.90
No. 2 southern, Chicago	50.00 to 54.00
No. 2 southern, Phila. del	53.00 to 54.00
No. 2 southern, Cleveland	50.00 to 52.00
No. 2 southern, N. Y.	52.75 to 53.75
No. 2 southern, Boston	53.50 to 54.50
No. 2 south. interior, N. E.	54.00 to 55.00
No. 2 southern, St. Louis	49.40 to 51.40
Virginia, No. 2X, furnace	52.00 to 53.00
Virginia, No. 2X, Phila.	54.75 to 55.75
Virginia, No. 2X, Jersey City	55.00 to 56.00
Virginia, No. 2X, Boston	55.25 to 56.25
Gray forge, eastern Pa.	50.00
Gray forge, Pittsburgh	52.95 to 53.95
Gray forge, Birmingham	45.50 to 46.00
Silveries, 8 per cent, furnace	80.00 to 85.00
Silveries, 8 per cent, Chicago	85.00 to 92.50
Low phos. standard, Phila.	92.00 to 93.00
Low phos. Lebanon furnace	83.00 to 85.00
Low phos., Pittsburgh	82.00 to 85.00
Charcoal, Superior, Chicago	59.50 to 62.00
Charcoal, Superior, Buffalo	55.00 to 60.00
Charcoal, Birmingham	55.00 to 60.00

COKE

(At the ovens.)

Connellsville furnace	$13.00 to 14.00
Connellsville furnace, contract	10.00
Connellsville foundry, contract	12.50
Connellsville foundry	12.50 to 14.00
Wise county furnace, contract	10.00 to 11.00
Wise county foundry, contract	11.50 to 12.00
Pocahontas furnace, contract	10.50 to 11.00
New River foundry, contract	13.00
New River furnace, contract	8.50 to 10.00

FERRO ALLOYS

Ferromanganese, prompt	$400.00 to 415.00
Ferromanganese, last half	**375.00 to 400.00**
Spiegeleisen, 20 per cent furnace remainder of year	80.00 to 82.50
Ferrosilicon, 50 per cent, Pitts.	225.00
Ferrosilicon, 50 per cent, Pitts., 1st quarter	130.00 to 150.00
Bessemer ferrosilicon, 9 per cent	$94.00
Bessemer ferrosilicon, 10 per cent	95.00
Bessemer ferrosilicon, 11 per cent	97.50
Bessemer ferrosilicon, 12 per cent	100.00
Bessemer ferrosilicon, 13 per cent	105.00

Ferrosilicon prices at Ashland, Ky., Jackson and New Straitsville, O., furnaces.

SEMI-FINISHED MATERIAL

BILLETS

Open hearth, Pittsburgh	$100.00 to 105.00
Open hearth, Philadelphia	100.00 to 110.00
Open hearth, Youngstown	100.00 to 105.00
Bessemer, Pittsburgh	100.00 to 105.00
Bessemer, Youngstown	100.00 to 105.00
Forging, Pittsburgh	125.00 to 135.00
Forging, Philadelphia	125.00 to 140.00
Forging, Chicago	**100.00**

SHEET BARS

Open hearth, Pittsburgh	$105.00 to 110.00
Open hearth, Youngstown	105.00 to 110.00
Open hearth, Cleveland	110.00
Bessemer, Pittsburgh	105.00 to 110.00
Bessemer, Youngstown	105.00 to 110.00

WIRE RODS, MUCK BAR, SKELP

Wire rods, Pittsburgh	$95.00 to 105.00
Muck bar, Pittsburgh	85.00 to 90.00
Grooved skelp, Pitts., nom.	4.00c to 4.50c
Sheared skelp, Pitts., nom.	4.50c to 5.00c

SHAPES, PLATES AND BARS

Structural shapes, Pitts.	4.50c to 6.00c
Structural shapes, Phila.	4.659c to 5.159c
Structural shapes, N. Y.	4.669c to 5.169c
Structural shapes, Chicago	4.94c to 6.19c
Tank plates, Chicago	10.19c
Tank plates, Pittsburgh	9.00c to 10.00c
Bars, soft steel, Pittsburgh	4.00c to 5.00c
Tank plates, Philadelphia	9.159c to 10.159c
Tank plates, New York	9.169c to 10.169c
Bars, soft steel, Chicago	4.50c
Bars, soft steel, New York	4.669c to 4.919c
Bars, soft steel, Phila.	4.659c to 4.909c
Cotton ties, Pitts., Aug.	$2.12
Bar iron, Chicago	4.50c to 5.00c
Bar iron, Philadelphia	4.909c
Bar Iron, Cleveland	4.50c to 5.00c
Bar iron, New York	4.919c
Bar iron, Pittsburgh	5.25c
Hard steel bars, Chicago	4.25c to 4.50c

RAILS, TRACK MATERIAL

Angle bars, Pittsburgh, base	3.75c to 4.00c
Angle bars, Chicago, base	3.25c to 4.00c
Standard bessemer rails, mill	$38.00
Stand. open hearth rails, mill	40.00
Light rails, 25 to 45 lbs., Chic.	65.00 to 70.00
Light rails, 25 to 45 lbs., Pitts.	75.00 to 85.00
Relayers, standard, mill	38.00 to 40.00
Relayers, light, Chicago	60.00
Relaying rails, light, St. L.	57.00 to 59.00
Spikes, railroad, Pittsburgh	6.50c to 7.00c
Spikes, railroad, Chicago	4.25c to 5.25c
Track bolts, Pittsburgh	5.50c to 8.00c
Track bolts, Chicago	5.25c to 6.50c
Tie plates, Chicago	$70.00 to 75.00

WIRE PRODUCTS

(Prices of independent makers.)

(To jobbers; retailers 5 cents more.)

Wire nails, Pittsburgh	$4.00
Coated nails, Pittsburgh	4.00
Plain wire, Pittsburgh	3.95
Galvanized wire, Pittsburgh	4.65
Polished staples, Pittsburgh	4.15
Galvanized staples, Pittsburgh	4.85
Barb wire, painted, Pittsburgh	4.15
Barb wire, galvanized, Pitts.	4.85
Cut nails, Pittsburgh	4.50

CHAIN, PILING, STRIP STEEL

Chain, ⅜ in. proof coil, Pitts. 9.00c

Sheet piling, base, Pittsburgh 4.00c to 5.00c

Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100 inch and heavier, base per 100 pounds, 9.00c to 9.50c.

Market Report Index

	Page
Weekly Market Review	267
Pig Iron	271
Tin Plate	273
Coke	273
Ferro-Alloys	274
Bars	274
Sheets	275
Semi-Finished Steel	275
Plates	276
Structural Shapes	276
Rails, Cars, and Track Materials	277
Scrap	278
Merchant and Cast Iron Pipe	280
Wire	281
Non-Ferrous Markets	282
Coke By-Products	305
Machine Tools	310

SHEETS

(In cents per pound.)

SHEET MILL BLACK.

No. 28, open hearth, Pitts.	9.00c to 9.50c
No. 28, bessemer, Pitts.	9.00c to 9.50c
No. 28, open hearth, Chic.	9.19c to 9.69c

TIN MILL, BLACK

No. 28, open hearth, Pitts.	9.00c to 9.50c
No. 28, bessemer, Pitts.	9.00c to 9.50c

GALVANIZED

No. 28, open hearth, Pitts.	10.25c to 11.50c
No. 28, bessemer, Pitts.	10.25c to 11.50c
No. 28, open hearth, Chic.	10.19c to 11.19c

BLUE ANNEALED

No. 10, open hearth, Pitts.	8.50c to 9.00c
No. 10, bessemer, Pitts.	8.50c to 9.00c
No. 10, open hearth, Chic.	8.94c to 9.56c
No. 10, open hearth, Phila.	8.659c to 8.909c

TIN PLATE

(Per 100 lb. box.)

Tin plate, coke base, nom. $10.00 to 15.00

IRON AND STEEL PIPE

(Prices adopted June 18, 1917.)

Steel

Diameter in inches.	Black. Per cent off.	Galv. Per cent off.
¼ to 3, butt	42	28½

Iron.

(Prices adopted June 30, 1917.)

Diameter in inches.	Black. Per cent off.	Galv. Per cent off.
¼ to 1½, butt	33	17

BOILER TUBES

(Price adopted April 2, 1917.)

Steel, 3½ to 4½ inches, l. c. l.	34
Iron, 3½ to 4½ inches, l. c. l.	28

CAST IRON WATER PIPE

(Class B Pipe.)

Four-inch, Chicago	68.50
Six-inch and over, Chicago	65.50
Four-inch, New York	68.50
Six-inch and over, New York	65.50
Four-inch, Birmingham	58.00
Six-in. and over, Birmingham	55.00

Class A pipe is $1 higher than Class B.

HOOPS, BANDS, SHAFTING

Hoops, Pittsburgh	6.00c to 6.50c
Bands, Pittsburgh	6.00c to 6.50c
Shafting, Pittsburgh, carloads	5 off to list

RIVETS

Structural rivets, Pittsburgh	5.25c
Boiler rivets, Pittsburgh	5.35c
Tinner's rivets, Pittsburgh	40 off

NUTS AND BOLTS

(Delivered within 20-cent freight radius.)

CARRIAGE BOLTS

(½ x 6 inches, smaller and shorter.)

Rolled thread	40 off
Cut thread	35 and 2½ off
Larger or longer	25 off

MACHINE BOLTS

(⅜ x 4 inches, hot pressed nuts.)

Rolled thread	40 and 10 off
Cut thread	40
Larger and longer	30
Cold pressed, semi-finished, hexagon nuts	50, 10 and 5
Gimlet and cone point lag bolts	40 and 10

NUTS

Hot pressed, square, blank	1.10 off
Hot pressed, square, tapped	1.90 off
Cold pressed, square, blank	1.50 off
Cold pressed, square, tapped	1.25 off
Hot pressed, hexagon, blank	1.90 off
Hot pressed, hexagon, tapped	1.70 off
Cold pressed, hexagon, blank	1.50 off
Cold pressed, hexagon, tapped	1.25 off

Prices Present and Past

(Yesterday, a month ago, three months ago and a year ago.)

Quotations on leading products August 8, average for July, 1917, average for May, 1917, and average for August, 1916. Prices are those ruling in the largest percentage of sales at the dates named.

	Prices Aug. 8, 1917.	Average prices July, 1917.	May, 1917.	July, 1916.
Bessemer pig iron, Pittsburgh..	$55.95	$57.95	$44.95	$21.95
Basic pig iron, Pittsburgh.....	52.95	53.20	42.15	18.95
No. 2 Foundry pig iron, Pitts..	55.95	55.95	43.55	19.45
No. 2 Foundry pig iron, Chic..	55.00	55.00	43.20	19.00
Lake Superior Charcoal, Chicago	59.50	59.50	49.25	19.75
Malleable, Chicago	55.00	55.00	43.20	19.50
Southern No. 2, Birmingham...	47.00	46.00	35.75	13.75
Southern Ohio No. 2, Ironton..	55.00	54.25	38.60	18.50
Basic, eastern Pa.....	51.00	50.75	40.75	19.25
No. 2X Virginia, furnace.....	52.50	52.25	41.00	18.50
No. 2X foundry, Philadelphia..	54.00	54.25	43.25	19.85
Ferro mang., delivered.....	400.00	430.00	425.00	170.00*
Bessemer billets, Pittsburgh....	100.00	100.00	85.00	43.50
Bessemer sheet bars, Pittsburgh	100.00	105.00	88.00	43.50
Open hearth sheet bars, Pitts..	105.00	105.00	88.00	43.50
Open hearth billets, Pittsburgh.	105.00	100.00	85.00	43.50
Steel bars, Pittsburgh.....	4.00	3.85	3.50	2.50
Steel bars, Chicago.....	4.50	4.50	3.49	2.79
Iron bars, Philadelphia.....	4.909	4.759	4.159	2.559
Iron bars, Cleveland, local del'y	5.00	4.50	3.25	2.40

*Seaboard.

	Prices Aug. 8, 1917.	Average prices July, 1917.	May, 1917.	July, 1916.
Iron bars, Chicago mill.....	$4.50	$4.50	$3.39	$2.35
Beams, Chicago	6.19	4.94	4.34	2.79
Beams, Pittsburgh contract.....	4.50	4.50	4.50	2.50
Beams, Philadelphia	4.909	4.909	4.659	2.699
Tank plates, Pittsburgh.....	9.00	5.65	4.50	2.90
Tank plates, Chicago.....	10.19	9.64	5.49	3.19
Tank plates, Philadelphia.....	10.159	10.159	8.159	3.909
Sheets, blk., No. 28, Pittsburgh	9.00	9.00	7.00	2.90
Sheets, blue anld., No. 10, Pitts.	8.50	8.50	6.65	3.00
Sheets, galv., No. 28, Pittsburgh	10.25	10.25	8.85	4.40
Wire nails, Pittsburgh.....	4.00	4.00	3.50	2.50
Connellsville fur. coke, contract.	10.00	9.65	8.00	2.45
Connellsville fdy. coke, contract.	12.50	12.40	8.50	3.15
Heavy melting steel, Pittsburgh	33.00	40.25	28.40	16.25
Heavy melting steel, eastern Pa.	33.00	37.00	26.00	15.00
Heavy melting steel, Chicago...	33.00	35.50	28.75	15.00
No. 1 wrought, eastern Pa.....	48.75	54.00	42.00	20.00
No. 1 wrought, Chicago.....	34.50	39.25	32.50	15.50
Rerolling rails, Chicago.....	40.50	46.25	36.75	15.75
Car wheels, Chicago.....	30.50	36.75	27.25	12.90

(For Additional Prices See Page 318)

Export Ban Ties Up Iron Tonnage

Large Quantity Accumulates at Seaboard and Gulf Points Awaiting License and Complicates Market Situation—Light Buying Generally Prevails—Enforced Curtailment of Production—Southern Strike Possibility a Factor

Philadelphia, Aug. 6.—Despite the many uncertainties confronting the pig iron market, prices are holding their own. The recent export license ruling prohibiting exports of pig iron except for actual use in war work has aroused keen interest in the trade, but what the actual market effects of this development will be, none can predict with accuracy. Japan has been one of the heaviest of foreign buyers of iron in recent months, and it is understood that a heavy tonnage in the aggregate for that and Scandinavian countries is lying in Atlantic ports and in New Orleans awaiting licenses. Some pig iron sellers estimate 40,000 tons are at gulf ports alone. It is generally believed that this step is a diplomatic move on the part of the government to cause Japan to divert part of her shipping to the Atlantic trade. At the same time, the possibility of the resale of some of this iron, since much of it was bought at levels below the present market is being pointed out. There is also much iron for Japan on furnace books for delivery over the remainder of the year. Much of this business was placed through exporting companies which stand to lose their paper profits in addition to expenses incurred, if licenses are not obtained. The situation is very complicated; exporters and furnacemen alike admit that they do not see daylight. As the furnaces took some of this future business at prices perhaps $10 or more under the current market, it is not impossible some of them may be willing to take on replacement business later. Fundamentally, the market is strong. Stocks are low and consumption proceeds at record pace. Consequently sellers view the situation confidently. The market continues quiet, the only large inquiry for steelmaking irons involves 5000 to 7000 tons for a New Jersey consumer for delivery over the remainder of the year. This transaction is being watched with interest, as it is expected to reveal the present level of basic prices. Another eastern steelmaker entered the market last week for 2000 tons of basic but has withdrawn. A sale of 1500 tons of southern warrant iron was closed at $45 for export prior to Aug. 15 to Japan. Southern furnace iron is firm at $47 to $50, Birmingham, for the remainder of 1917, but it is reported $45 can be done for the first half of 1918. A York, Pa., consumer bought a small lot of prompt No. 3 southern foundry at $49, Birmingham. Eastern Pennsylvania No. 2X is firm at $53 to $55, Philadelphia. A few carloads of nearby shipment Virginia No. 2X iron were sold at $51, furnace, but this is hardly representative of the general market, which continues about $52. A sale of 2000 tons of standard low phosphorus iron for Italy was closed at slightly under $90, furnace. Japan bought 4000 tons at $90, furnace, for delivery over the next three months. This sale was closed just before the new license ruling was announced.

Italy Wants Tonnages

New York, Aug. 7.—Several good-sized inquiries for bessemer iron for export to Italy are in the market, one involving 15,000 tons and another 12,000 tons. As this iron is destined for use by the Italian government, it is probable no difficulty would be met in obtaining licenses. Several export inquiries for other grades have appeared before sellers in this dis-

trict, but domestic demand continues of extremely small proportions, being principally filling-in lots for prompt or nearby shipment. A Paterson, N. J., consumer is in the market for 400 tons of No. 2 foundry, and 400 tons of No. 3 for shipment during the first quarter of next year. Prices on northern grades are holding firm in this territory, although there are reports of southern iron, particularly warrants, being offered lower. No sales of basic or malleable are reported. A Newark, N. J., consumer who recently was inquiring for 500 tons of No. 2X for shipment over the first half, has not yet closed.

Production is Cut Down

Pittsburgh, Aug. 7.—Mid-summer dullness characterizes the pig iron market in western Pennsylvania. No inquiries of importance have come out for several weeks, and scarcely any metal has been sold direct by producers for 30 days or longer. As far as can be learned, no additional lots of re-sale iron have been turned over this week. Prices show no important change in position, with bessemer, foundry and malleable held generally at $55, valley; basic also is held at that price by many sellers, although a 1000-ton lot was purchased about 10 days ago at $52, valley. That prices will recede somewhat before fall is considered not unlikely though those in close touch with the situation expect that quotations eventually will resume their advance; it is predicted by some people that bessemer will command $75, valley, before Dec. 31. This prediction is based upon figures indicating that not much additional metal is available for this year. Several pig iron merchants virtually have withdrawn from the market for delivery before Jan. 1. Furnace stocks are low. Consumption of steelmaking grades is extremely heavy, and producers are being urged more frequently to ship material with the greatest possible dispatch. Production has been reduced 10 per cent to 15 per cent by the hot weather. One of the larger steel works interests reports that its pig iron production in July declined 17 per cent, as a result of the extreme heat, which affected blast furnace and coke oven operations.

Fair Selling is Done

Buffalo, Aug. 7.—Some inquiries for various grades of iron have appeared in this district, but the prices remain unchanged. Malleable is in slightly greater call than foundry grades, though there is not as much of the former quality being sold. The furnaces have been held back somewhat on malleable because of shipping difficulties, and this situation now is exerting a little pressure. The majority of furnaces report a very quiet market with not much business for early or forward deliveries. On the other hand, one interest has been accepting a few orders for spot and future delivery, and has disposed of during the week what is considered a sizeable tonnage at this time, 7000 tons. This business was principally done by an eastern producer locally controlled. Usually very little interest is manifested by sellers as well as buyers since most of the furnaces have practically no iron. There is some shortage of cars, but the situation regarding carriers is looked upon as trivial compared to what will be the case after the military cantonments have been established. In general, sellers are looking for no buying movement until the national situation develops, though some interests report a little more confidence on the part of buyers during the past week than during the several weeks preceding.

All Want Shipments

Cleveland, Aug. 8.—Activity in pig iron in this district is shown only on the side of shipments where customers continue to make demands upon the furnaces with great vigor. Humid weather has had some effect in cutting down production and has added to producers' difficulties in satisfying customers. One of the furnaces of the River group, Cleveland, which has been on foundry, is about to go out for relining. New sales are of a scattered character, principally of foundry and malleable grades and amount to only a few thousand tons weekly. This business usually is going on the basis of $55, valley, or lake furnace, and deliveries cover various periods up to July 1 of next year. A sale of several carloads was made in the week at $56, furnace. Sellers of basic are holding their prices unchanged at $53 to $54, valley, but these figures are nominal, as there is no inquiry. Sales of southern Ohio bessemer ferrosilicon have been made at lower prices.

All Deliveries Behind

Chicago, Aug. 7.—Chicago buyers and sellers of pig iron are exhibiting no activity and the market is as dull as at any time in many years. The few inquiries which do come are for small tonnages for prompt delivery to fill in until iron on regular contracts is available. This demand seems to be caused principally by delays in receiving iron bought months ago. Almost every furnace is behind on its deliveries, partly from lack of cars and partly from poor quality of coke. Northern No. 2 foundry, malleable and basic continue to be quoted nominally $55, furnace. Southern iron is equally dull, but occasional sales of consignment iron for immediate delivery are made at $50, Birmingham. The tonnage thus placed is small. A large Alabama producer recently took a small tonnage for first half of 1918 delivery at $48.50, Birmingham. Low phosphorus iron is scarce and the quotation seems to be $85 to $100, furnace. Lake Superior charcoal iron is inactive and unchanged. Tightening of the export embargo has caused heavy inquiry from Pacific coast buyers for various grades of pig iron. Within the past few days numerous exporters there have sent inquiries for heavy tonnages broadcast over the iron-producing states, but the date of shipment would have made it impossible to fill these requirements even were the furnaces not sold as far ahead as is the case. Lack of fuel is causing considerable curtailment of production. The leading steelmaker in this district has three stacks idle because sufficient fuel cannot be provided. All merchant stacks are operating, but inferior grade of coke is causing much trouble and reducing output.

Market is Dragging

Cincinnati, Aug. 6.—The market continues to drag, although there is a little better inquiry. The largest reported is for only 300 tons of southern foundry iron for this year's shipment. The majority of iron merchants hold to the idea that it is not advisable to try and force the issue just now, and are leaving buyers free to exercise their own judgment as to covering for the future. A few carload lots of 8 per cent Ohio silvery iron have lately been disposed of around $85 at furnace. Sales of 10 per cent have been made at lower prices. Southern iron prices are stationary and small lots for spot shipment are more readily disposed of at market quotations. Shipments from the south are coming forward at a fairly satisfactory rate, but the hot weather and consequent shortage of coke may affect the situation adversely before the month is over. Virginia No. 2X is quoted at from $52.50 to $53, furnace, and several small sales were made in this territory lately. Northern No. 2 foundry is unchanged at $55, Ironton, with little business reported. Furnace stocks are depleted in that district

and there is very little resale iron to offer.

Watching Strike Developments

Birmingham, Ala., Aug. 7.—The lull in pig iron buying is continuing, but it has had no effect on the market and quotations remain firm. A few carloads for this year were sold during the past week, and the highest prices were obtained. Quotations are on the basis of $50 for No. 2 foundry for the last half of this year, and $48 for next year. There is a little easier feeling as to the prospect of government needs swamping the manufacturers to the exclusion of the domestic trade. A few scattering orders have been received in the distribution of government contracts and delivery on these is being rushed. The domestic consumers of iron still are holding off believing there will be some regulation of the iron and steel trade. Some consumers again are urging prompt delivery on contracts placed some time back, while a few are asking for anticipations. The transportation facilities are such that a steady reduction of the iron on hand is resulting. Special brand and analysis irons are commanding premiums of from $1 to $1.50 and a few cars have been sold on this basis. The organization of United Mine Workers of America, Alabama district No. 20, has served notice through its convention that if recognition and demands are not met by August 15 a strike will be declared Aug. 20. There is some apprehension that this may affect the iron activities of the district if the strength of the organization has been correctly stated and there is a cessation of operations for any length of time. The coal operators announce positively they will not recognize the union and ask that those who do not care to remain in their employ to vacate the houses and not interfere with those who remain at work.

Spot Coke Shoots Upward

Hot Weather and Reduced Car Supply Put 48 Hour Fuel at $14—Southern Strike Threatens

Pittsburgh, Aug. 7.—The hot wave of the past week, and a sharp decrease in the car supply have combined to strengthen the market for spot furnace coke. Forty-eight-hour fuel for shipment to consumers on the Pennsylvania railroad today commanded $14, ovens, $4 above the price last week. For shipment to points on the Pittsburgh & Lake Erie railroad, spot coke today was obtained at $13, ovens. Several cokemakers say the market will touch $15 before the end of the week. Many coke oven employes were knocked out by the heat last week, making it impossible to charge and draw scores of ovens. The car supply last week dropped to about 55 per cent to 60 per cent, compared with 80 per cent the week before. July car average was 87 per cent, the best by a considerable margin of any month this year. Yesterday and today, about a 75 per cent placement was reported. The market for contract furnace coke and foundry coke is quiet. Blast furnace managers buying the bulk of their fuel on the spot market continue to enjoy preferential prices. Production of coke the week ending July 28 was 367,355 tons, compared with 362,148 tons the week before, according to the *Connellsville Courier*.

Spot Brings Premiums

Philadelphia, Aug. 6.—Spot furnace coke underwent another flurry during the past week owing to shortage of cars east from the Connellsville district. Furnace coke last Friday commanded a premium of about $2 a ton over the same fuel at western points. On July 30 spot furnace coke sold in eastern Pennsylvania at $10.50 to $11, Connellsville; on Aug. 1 at $11 to $11.50; on Aug. 2 at $11.50 to $12.25; on Aug. 4 at $13 to $13.50.

Spot foundry coke prices range from $13 to $14, Connellsville.

No Coke to Stock

Birmingham, Ala., Aug. 7.—Coke production in Alabama scarcely can be increased with present facilities and as there is need for every ton being produced, efforts to accumulate stock against a probable strike in the coal mining section are meeting with little success. It is not believed that in the two weeks intervening before the strike is scheduled to go into effect that much of the product can be piled up. High prices still prevail for all the coke that can be offered. For a week or two, however, practically no coke has been offered on the market. Foundry coke is quoted at $10 to $12.50 and furnace coke at $6 to $8, ovens.

The 60 additional by-product coke ovens of the Woodward Iron Co. will be completed next month. The Birmingham Trussville Iron Co. will have its battery of bee-hive ovens in operation this month. The New Castle Coal Co. continues to ship coke in sealed box cars to Laredo, Tex., for shipment to smelting companies in Mexico.

Weather Causes Trouble

Cincinnati, Aug. 6.—Coke complaints are more numerous. The hot weather and the labor shortage is causing distress in all producing districts. Delayed shipments have not yet caused any appreciable inconvenience to the foundries in this immediate vicinity, but those who have small stocks of coke on hand are becoming very apprehensive as to the future. As a result of the shortage both furnace and foundry coke, loaded on cars, now command fancy prices. Some furnace coke was reported sold in the Connellsville field as high as $15, but this cannot be definitely confirmed except as to one car. Contract figures are unchanged. Consumers are not now inclined to attempt to hammer down prices when a reasonable assurance can be obtained that the fuel will be shipped.

Government Buys

Tin Plate For Shell Containers at $8.50—Export Order at $7.50

Pittsburgh, Aug. 7.—Tin plate manufacturers are beginning to ship material purchased for delivery the second half of the year, on the basis of about $7.50 to $8, base. Material shipped the first six months of the year, on contracts placed the latter part of 1916, commanded from $5.75 to $6, base. The government has purchased some tin plate for the manufacture of shell containers, paying $8.50, base, for steel of special gage. England and Italy continue to negotiate for tin plate in this country; it is likely that both countries will be able to obtain desired tonnages through this government. A lot of 10,000 boxes of tin plate recently commanded $17.50, base, for export, and as high as $25 per box has been offered by exporters.

Starts Idle Stack

The Musconetcong Iron Works, Elizabeth, N. J., has put in blast its Stanhope furnace blast, which has been idle for some time. The Musconetcong furnace consists of a stack 80 x 17 feet, built in 1871 and rebuilt in 1900, three stoves and two steam blowing engines. It was formerly operated on New Jersey magnetic, lake, Cuban and other ores and produced 50,000 tons of iron annually.

Ferro Up On Small Sales

Tonnages Remain at $400 Delivered But Odd Lots Bring $440 and $450—Government Buys—Spiegel Active

New York, Aug. 7.—While few large inquiries for ferromanganese are in the market, there are a great many inquiries for small lots. The general prompt market quotation remains $400 delivered, but on this small business much higher prices are being done. Some sales as high as $440 and one, of guaranteed analysis, at $450, have been closed. The ore situation continues light. There are no indications that English alloy will figure as a market factor in the near future. Several domestic makers have advanced their quotations to $410 and $420 for prompt delivery. The government is buying a few carloads of ferromanganese from time to time for navy yard and arsenal use, going direct to makers and paying open market quotations. Some makers are asking $375 for delivery the first half of 1918, but the general market continues $375 for the last quarter of 1917 and $350 for the first half of 1918.

The large inquiries for spiegeleisen noted a week ago, including 3500 tons for the Whitaker-Glessner Co., Portsmouth, O., and another for 1500 tons, have not yet been closed. A few small lots have been closed in this territory recently around $82, furnace, for prompt delivery. About $76 to $77 is asked for the first half of 1918.

One maker of ferrosilicon continues to ask $130, delivered, for shipment the first half of next year. Other makers generally quote $150. The prompt market continues around $225, delivered, but little business is being done.

The market for ferrosilicon is rather quiet but strong. Sales have been made recently on the basis of $2.40 per pound. The market may be quoted $2.35 to $2.60 per pound.

Alloys Mark Time

Pittsburgh, Aug. 7.—The market for ferroalloys is almost at a complete standstill in western Pennsylvania. No new demand for ferromanganese is reported. This metal generally is held at $400, delivered, for shipment within the next 60 days. For extended delivery, lower prices are being quoted. Forty per cent ferrosilicon is listed at $225, Pittsburgh, for delivery this year. Lower grades of bessemer ferrosilicon continue to be quoted on the basis of $95, furnace, for 10 per cent.

Consumers Want Spiegel

Cleveland, Aug. 7.—Several inquiries for spiegeleisen have been put out in this district by consumers who are changing their practice to use this metal instead of ferromanganese under the movement to conserve the supplies of the latter material. A figure of $85, furnace is regarded as the market for nearby shipment.

Prompt Ferro at $400

Chicago, Aug. 7.—Ferromanganese is inactive with quotations unchanged. Some small tonnages have been sold recently for prompt delivery at $400, furnace, and fourth quarter at $375, furnace. Makers are sold far ahead and comparatively little selling is being done.

Implement Bars Wanted

Farm Machinery Manufacturers Seek Last Half Contracts But Makers Are Cautious—10,000 More Army Wagons in Market

Chicago, Aug. 7.—Makers of soft steel bars have practically nothing to sell except to the government. Inasmuch as the latter's requirements have been increasing and have gone far beyond expectations, the private buyer seems likely to be disappointed in obtaining further material. Mills in this district have taken 2000 tons of soft steel bars for camp cots. Some agricultural implement makers who have not been able to cover for the first half are anxious to place business for that delivery in order to get a price and to be able to make estimates on their production costs on deliveries to be made early next year. So far it cannot be discovered that any business of this sort has been placed. Some small sales for domestic use have been made recently at 4.69c to 5.19c, delivered Chicago. Hard steel bars are unchanged at 4.25c to 4.50c, Chicago. There is some inquiry both for manufacturing purposes and for reinforcing, ranging from 50 to 200 tons each, but most of these are not entertained by makers. There is a moderate inquiry for bar iron, especially for next year's delivery. Makers are not anxious to sell for that period and such inquiries as a rule are declined. The range for delivery during the present year is 4.50c to 5c, Chicago mill.

Buy More Shell Steel

Pittsburgh, Aug. 7.—The government and munition makers continue to buy heavy tonnages of steel bars, additional contracts for shells being placed daily. Munition makers, however, are not making any public announcements about their activities. Specifications for bars for shipment to automobile makers have fallen off appreciably and it will be some time before this tonnage is absorbed by consumers working on contracts for military necessities. The domestic market borders on stagnation. Iron bars are being held at 5.25c by mills in this district.

Will Order More Wagons

Cleveland, Aug. 7.—Another large order for consort wagons for the army is believed to be in prospect. It is reported that 10,000 may be purchased, which would bring the total of recent contracts up to 60,000 wagons. Inquiries for the steel for these wagons continue to come out. Implement manufacturers in this district are making renewed efforts to get producers to consider contracts for steel bars for the last half, but the latter are holding off from entering into these commitments. With some exceptions, automobile builders are specifying more lightly. Some of these plants continue to place preliminary orders for steel for aeroplane construction which they are undertaking.

Hoops and Bands Firm

Pittsburgh, Aug. 7.—Quotations on hoops and bands have not been tested recently, but no signs of weakness are noted. Distilling interests have not figured in the market since the ban on liquor production assumed definite form, but this has not disturbed conditions.

Demand for Chain Heavy

Pittsburgh, Aug. 7.—Chain manufacturers say demand is heavier than ever before in the history of the industry. The government and private shipbuilders have been buying large quantities for a year or longer. Prices have advanced sharply the last few

weeks. Makers are asking 9c and above for ⅜-inch proof coil.

Shafting for Fuses

Pittsburgh, Aug. 7.—Fully 40 per cent of the capacity of shaftingmakers is being devoted to the manufacturer of munitions in various forms, according to conservative estimates. Before the end of the year, approximately 75 per cent of the output of shafting mills will be used directly or indirectly by the government. Cold rolled steel shafting continues to be held at 5 per cent off the list to the list price.

More Orders

For Sheets Placed by Government Leaving Open Market Quiet

Pittsburgh, Aug. 7.—The government continues to dominate the market for steel sheets, although no large individual orders have been placed this week through the sub-committee on sheets of the American Iron and Steel Institute. Mill managers are not attempting to figure in the market for prompt shipment, preferring to divert as much tonnage as possible to the government. Mills nominally are quoting black sheets at 9c to 9.50c, galvanized sheets at 10.25c and above and blue annealed products at about 8.50c. The bulk of the material now being shipped was obtained at considerably less than these figures.

Can't Load Foreign Cars

Youngstown, O., Aug. 7.—The sheet market continues quiet with but few sales recorded other than contract business. One order for a small tonnage of blue annealed, No. 10, brought 9c. Galvanized and black, No. 28, remain stationary at 10.25c to 11.50c and 9c to 9.50c respectively. Rolling schedules are being interrupted due to the railroad ruling that went into effect Monday, that material on board foreign cars would not be moved. For example, commodities to be shipped via the Baltimore & Ohio railroad are not to be moved unless loaded on Baltimore & Ohio cars.

Demand is Active

Chicago, Aug. 7.—Demand for steel sheets continues active but Chicago producers are able to entertain inquiries only from the government or from consumers engaged directly on government work. For No. 28 gage black sheets from 9.19c to 9.69c, Chicago mill, is quoted. On No. 10 gage blue annealed the price ranges from 8.94c to 9.54c and on No. 28 gage galvanized from 10.69c to 11.69c.

Ingot Output Grows Fast

Theoretical Capacity of Country Now Rated at 49,500,000 Tons With 4,000,000 Tons Building—Gun Steel is Bought

Pittsburgh, Aug. 7.—According to conservative estimates, subsidiary companies of the United States Steel Corp. and independent concerns have increased theoretical ingot producing capacity from about 42,500,000 tons to 49,552,000 tons per year since Jan. 1 last. Moreover, steel works additions and extensions now under course of construction shortly will increase theoretical ingot producing capacity to approximately 54,000,000 tons, far exceeding predictions made by observers early this year. Through various sub-committees of the American Iron and Steel Institute, the entire steel works capacity of the country has been mobilized effectively for military purposes, but the government has not found it necessary as yet to take advantage of the full industrial resources of the nation. Additional capacity, which has come in during the last 12 months will make it comparatively easy for the steel industry to meet the needs of this government and its allies. Demand for semifinished steel has not reached the proportions it will attain after the war machinery at Washington runs more smoothly. Manufacturers of munitions, for instance, are not absorbing steel diverted to domestic channels before the United States entered the war. Quotations on forging billets and ordinary soft steel billets and sheet bars have not been tested recently. In the absence of sales, no changes in quotations are made on these products.

Strip Steel for Aircraft

Pittsburgh, Aug. 7.—Demand for cold rolled strip steel for aeroplane construction is heavy. The government is expected to be a prominent factor in the market as soon as plans are completed for the extensive building of aircraft which has been outlined. Cold rolled strip steel is quoted at 9c to 9.50c, base.

Huge Tonnage Awaits Ships

New York, Aug. 7.—Several small inquiries for special grades of shell steel are in the market for allied governments. The allies have not figured extensively since their heavy purchases last fall; shipments have been going forward steadily, but they seem still to have a good-sized backlog to fall back upon. It has been estimated by some shell steelmakers that approximately 500,000 tons are lying at Atlantic ports awaiting ships.

Billet Prices Shaded

Philadelphia, Aug. 6.—Demand for semi-finished steel remains inactive and some shading of billet prices is reported. Offerings of open-hearth rerolling billets at $105 have not attracted buyers and sales at $97 to $100, Philadelphia, are reported. An export inquiry for 3000 tons of small billets is the largest lot of new business offered makers in the past few days.

Hold Shell Discards

Youngstown, O., Aug. 7.—Makers of shell steel are inclined to stock their shell discards until some future time. With the present high prices for scrap makers prefer not to offer their discards on the market, but to hold them as an insurance against their own needs. The sheet bar market shows no developments. A price of $105, mill, generally is regarded as representative of the market.

Gun Steel Bought

Cleveland, Aug. 7.—A leading industrial plant in this territory, who is preparing to go into the production of ordnance on a large scale, finally has placed an order with the Carnegie Steel Co. for 6000 tons of nickel steel for forgings for 3 and 4-inch guns. The Italian government has been inquiring for 11-inch shells, and an inquiry for 2500 tons of steel covering 60,000 of these projectiles has been put out here by a plant which has been figuring on this business. Delayed deliveries under regular contracts have forced some buyers into the market for lots of special steel. One inquiry for 1000 tons of electric steel and another for 500 to 1000 tons monthly of chrome-nickel steel for the balance of the year have been current. There is considerable doubt whether this material will be bought because of the high prices quoted.

Furnaces Resume

The Lebanon Valley furnace of the Lebanon Valley Blast Furnace Co., Lebanon, Pa., again is in blast after having been out for about six weeks for repairs. The No. 3 Bird-Coleman furnace of the Bethlehem Steel Co. at Cornwall, Pa., has resumed operating after being out for relining.

Rush Plates For Export

Producers and Buyers Make Strong Efforts to Get Tonnage Away Before Embargo Becomes Effective August 15

Pittsburgh, Aug. 7.—Rolling mill managers are making every possible effort to fill orders for export before Aug. 15, after which date it will be impossible to ship plates abroad, except under license. Licenses are expected to be extremely difficult to obtain after the President's embargo becomes effective. Buyers of material for export have been active factors in the market this week. They have been offering decidedly attractive prices, and many prospective buyers have produced licenses, in order to induce manufacturers to consider their inquiries. The bulk of the plate tonnage now being rolled for shipment abroad was purchased at 10c and above, making the export trade much more attractive than domestic business. Immediately after Aug. 15, the trade looks to see heavy tonnages of re-sale plates offered in the open market, but it is believed this material will be absorbed rapidly. The commandeering of 25 shipyards by the Emergency Fleet Corp. presages a tremendous demand for ship material. The Jones & Laughlin Steel Co. has completed an 128-inch plate mill and a battery of six 50-ton open-hearth steel furnaces. The domestic situation for structural shapes is quiet. Fabricators admit that the government is buying huge tonnages in the aggregate, but no information is being offered about these orders.

Export Conditions Chaotic

New York, Aug. 7.—The situation relative to export licenses on ship steel is chaotic. Mills are taking little export tonnage on their books for any delivery, being inclined to wait until conditions are less tangled. In some quarters it is believed that the embargo so far as Japanese business and ships is concerned, may be lifted within a comparatively short time after Aug. 15, when the ruling is effective. In case the ruling remains effective for any length of time, sellers say they are unable to predict what market effect will ensue. These export orders, as usually, are taken against letters of credit; in some cases the letters of credit do not expire until July 1, next year. It is believed that in most cases export business will remain live tonnage on mills' books until the letters of credit expire, and after that they may be cancelled, or be the subject of new negotiations between buyers and sellers. It is estimated that over 400,000 tons of ship steel, mostly plates, are on mills' books for delivery for export to Japan over the next 12 months. Price of plates continues to vary with almost every individual transaction. As high as 11c is being offered for tank plates and the mills are turning away business at such figures. A large volume of business is overhanging the market in connection with the government steel shipbuilding program, but this program has not yet developed to a point sufficient to release this business. The minimum price asked by eastern mills on tank plates for shipment at their own convenience is 10c, Pittsburgh, or 10.169c, New York. No further large allied business has been taken since the distribution of the 60,000 to 70,000 tons of plates by the French government, recently.

Specifications Very Heavy

Philadelphia, Aug. 6.—Eastern Pennsylvania platemakers state that specifications the past week have been very heavy against contracts for car, locomotive and ship steel, amounting to at least several hundred per cent of mill capacity. Large inquiries appeared daily, both for foreign and domestic consumers. Export inquiries and those not coming from regular customers, however, were declined by most mills. Many thousand tons of business were turned down during the week. The government continues to furnish specifications freely. Much bridge work is in the market and the various bridge companies are using 10.159c, Philadelphia basis, or equivalent, in making their estimates. Orders for several thousand tons of tank plates were placed on the basis of 10c, Pittsburgh. Platemakers are watching the export situation closely, in view of the huge amount of ship steel on books, especially to Japan. It is difficult for consumers to get any promise of shipment under 10 to 12 months after receipt of order and then only with the proviso that the promise is subject to interference by government requirements.

Prices Continue High

Chicago, Aug. 7.—Difficulty in obtaining steel plates continues the feature of that market. The embargo on foreign shipments unless the material is to be used directly for the benefit of allied countries seems likely to prevent shipments of some plates sold for Japanese use. This situation has not become clear and mills are uncertain how it will work out. Inquiry for export continues and 10.34c, Chicago, was offered recently on 2500 tons, but delivery requirements were such that the business could not be entertained by Chicago makers. Sales have been made at 11c to 12c, Chicago, but inability to furnish tonnage has prevented much of this high-priced business being taken.

New Work at Standstill

Structural Undertakings of Commercial Character Continue to Fall Off in All Sections—Concrete Building Also Slumps

Philadelphia, Aug. 6.—New building steadily is approaching a standstill, except in connection with war work. Shipbuilders are absorbing a large quantity of steel for expansion of their yards, and when some projects now under way are finally launched a big tonnage of steel will be required. The sold-up condition of mills and shops and the high prices for material are exerting and extremely repressing influence on building projects, which, it is expected, will accumulate and form a good back-log to fall back upon after the present abnormal condition has passed. Fabricators say that three or four months are required to obtain shipments of plain material, while the fabricating shops are not making promises of less than eight months and up in the case of ordinary projects, owing to the pressure of government work. Prices as far as defined are unchanged.

Lettings Still Fall Away

New York, Aug. 7.—Aside from government requirements, new construction is almost nil. Structural steel lettings in this territory are diminishing steadily. Practically the only demand is for small tonnages, and these do not amount to a large volume in the aggregate. Because of the uncertainty as to just what the government requirements will be fabricators are unable to promise definite deliveries. For this reason and also due to the fact that prices are high, and that fabricators are sold

up many months ahead, demand is being repressed. Plain material prices show no change.

Divide Tonnage for Plant

Buffalo, Aug. 7.—The Buffalo Structural Steel Co., the Hamilton Bridge Co., of Hamilton, Ont., and the Blaw-Knox Co., Pittsburgh, participated about equally in the division of the 4000 tons of structural for the Curtiss Airplane & Motor Corp.'s new plant here. The awards were made by the Austin Co., Cleveland, which has the general contract.

Dullness is Unprecedented

Cleveland, Aug. 7.—Apart from an inquiry from 4000 to 6000 tons of shapes, from a large industrial company in this district which is planning important extensions, the structural market is flat. Some builders report that the inactivity is practically unparalleled in their experience and they are looking forward to a period of considerable unemployment among artisans. A sharp falling off in concrete construction also is reported. A 2500-ton lot of steel for the Philadelphia public library is yet to be bought by Cleveland contractors.

Western Market Quiet

Chicago, Aug. 7.—Practically no new business is being offered in the structural market. The largest project now under consideration in the Chicago territory involves about 200 tons. Aside from this, the market offers only a few small tonnages. Mills have been reserving much capacity for material to be used in the government shipbuilding program and lack of progress by that board is causing some inconvenience.

CONTRACTS AWARDED.

Storage building for Worthington Pumping Machinery Co., Harrison, N. J., 1000 tons to National Bridge Co.

New plant for the Curtis Airplane & Motor Corp., Buffalo, 4000 tons, divided among the Buffalo Structural Steel Co., the Hamilton Bridge Co., and the Blaw-Knox Co.

Buildings for M. H. Treadwell Co., Johnson City, Tenn.

Addition for Bullard Machine Tool Co., Bridgeport, Conn., 250 tons to Porcupine Co. 300 tons to an independent fabricator.

CONTRACTS PENDING.

Bridge for Chesapeake & Ohio Railroad, 600 tons, bids being taken.

Coal pier for Central Railroad of New Jersey, 250 tons, bids being taken.

Bridges for Pennsylvania Railroad, 200 tons, bids being taken.

Plant addition, Hanover Wire Cloth Works, Hanover, N. J., 150 tons. Bids being taken.

The American Sheet & Tin Plate Co. has completed plans for erecting a hotel and club house at Sharon, Pa. The building will cost $75,000.

Figure Artillery Trucks

Car Builders Take Up New War Proposition—France Wants Many Cars—Await Government Rail Specifications

New York, Aug. 7.—The United States government has issued an inquiry for several hundred artillery trucks, and American car builders are figuring on this inquiry, which corresponds with a similar inquiry for the French government more than a year ago. At that time car builders declined to touch this business because of the complicated machine work involved. The government has not yet closed for cars, said to number 10,000 for use on its proposed roads behind the American front in France. The French government also has entered the market for 17,000 four-wheel 12 metric ton flat-bottom gondolas. The Chilean railways, which recently was inquiring for 400 stock and 600 box cars, has withdrawn this inquiry. The Long Island railroad which was inquiring for 25 passenger and baggage cars and 40 coaches, also has withdrawn. Builders are operating only a small part of their capacity in the building of railway equipment. High prices for steel and other materials have made prices of cars almost prohibitive, and new car orders continue extremely light.

No orders yet have been distributed by the government for the large amount of track fastenings and other supplies for which it has been in the market in connection with its purchase of 150,000 tons of rails for use in communication lines behind the battle line in France.

Spike Demand Heavy

New York, Aug. 7.—Demand is heavy for boat spikes in connection with the present activity in building wooden ships. The price of boat spikes is 8c a pound, mill. Railroad spikes are quoted as follows: 9/16 x 5½-inch, 5.50c to 6.50c, net; ½ x 3½ to 5-inch, 6.50c to 7.50c, base; small sizes, ⅜ and 7/16-inch, 7.50c to 8.50c, base.

Rail Mills Await Specifications

Pittsburgh, Aug. 7.—Specifications for 150,000 tons of 80-pound steel rails placed a week ago for the construction of tracks behind the American front in France, have not been sent out. The Carnegie Steel Co., the Illinois Steel Co. and the Tennessee Coal, Iron & Railroad Co., subsidiaries of the United States Steel Corp., each will furnish 30,000 tons, and the remaining 60,000 tons will be rolled by independent concerns. Nearly all the mills called upon to furnish this material will be forced to make new rolls, since they are not equipped to manufacture 80-pound sections according to specifications of the American Railroad Association. The order could have been filled without delay if a 75-pound or an 85-pound section had been specified, it is pointed out. The entire order will be filled and delivered to eastern ports before Oct. 1. Some time ago, railroad cars and locomotives were ordered in this country for shipment to France, although it is not unlikely that 10,000 additional cars will be purchased at an early date. Railroad officials say it will take approximately 100,000 cars to provide food, clothing and munitions for the 1,000,000 members of the militia and new national army who soon will be in 16 cantonments scattered throughout the country. The opening of these camps will make the railroad car shortage more acute than ever.

Will Give French Car Orders Preference

Chicago, Aug. 7.—A new inquiry by the French government for 6000 freight cars has come to light. These will involve 50,000 to 60,000 tons of steel, indicating cars of a considerable size, and larger than the usual European standards. Although details are lacking, it is understood this order will be given preference and the cars shipped at as early a date as possible as a military necessity. They will be constructed in units and shipped "knocked down". One American company maintains an erecting plant in France, which may expedite matters considerably in assembling the cars. Considerable losses have been met with during the war by car builders. One cargo containing 2200 small cars for Russia was sunk early in the war and other similar losses have reduced the number of American-built cars reaching Europe. The American Car & Foundry Co., which took two-thirds and the Standard Steel Car Co., one-third of an order for 10,000 four-wheeled cars for the Russian government some weeks ago, are beginning to turn out equipment for immediate shipment. Material for their construction has been furnished as a special war requirement and the en-

tire lot will be built in as short a time as possible. Although some inquiry is current for track fastenings, the leading interest has none for sale and smaller makers are not taking much of the business offered.

Scrap Showing is Better

Undertone Improves in Some Districts—Certain Grades Advance at Buffalo—Car Restrictions at Chicago

Chicago, Aug. 7.—Slow change is taking place in the Chicago scrap iron and steel market and the quiet period which started last week is continuing. In a few instances slight advances have been made and some grades have declined equally. This is simply a readjustment after the rapid decline of the last month. Not much buying has been done by consumers for several weeks, and a resumption of activity is expected shortly when reserves have been cut down. Although accumulations are not large, there is considerable scrap in yards. The Illinois Central railroad has notified all scrap shippers that it will furnish coal cars for scrap transportation only for destinations within the Chicago switching district. For scrap moving farther, cattle cars and box cars only will be furnished. With this provision in effect during the summer, it is easily seen that winter shipments must be made entirely in closed cars, which is much more costly to the shipper, due to difficulty in loading and unloading.

Metropolitan Conditions Dull

New York, Aug. 7.—Trading in iron and steel scrap this week is considered by dealers the dullest of any week this year. Prices continue to sag off in various descriptions, old car wheels having declined $1 a ton the past few days; city wrought, long stock, $2 to $3 a ton, and No. 1 machinery cast from $38 to $36 and $37. An embargo has been in effect at Harrisburg, Pa., since last Saturday, both on the Reading and on the Pennsylvania railroads.

Further Declines in East

Philadelphia, Aug. 6.—The eastern Pennsylvania scrap market has eased off perceptibly during the past week, due to the fact that mills are well covered over the near future and are not inclined to commit themselves extensively under existing conditions. Dealers also are fairly well covered on their recent higher price contracts, so they are not bidding for material. Comparatively little interest is being shown by dealers in this territory in the recent export license ruling, it being asserted that bookings of scrap for export are almost negligible, owing to the high domestic market prevailing the past few months. Traffic conditions have improved somewhat. The embargo on the Reading railroad at Lebanon has been lifted, but the embargoes at the plant of the Alan Wood Iron & Steel Co. and at Coatesville are still in effect. Prices during the week have declined as follows: Rerolling rails, $2; heavy melting steel, $1; No. 1 railroad wrought, $4; wrought pipe, $4; stove plate, $1; No. 1 forge, $1; bundled sheet, $1; frog, switch and girder rails (cut), $1.

To Salvage Big Tonnage of Mexican Scrap

Ashland, Cal.—A million dollar corporation is being formed by eastern capitalists to salvage approximately 300,000 tons of iron and steel scrap, which is the property of the Mexican National railway, according to a statement made by Joseph F. Carlson, president of the Central National Bank of Oakland, Cal. Mr. Carlson is assisting in the organization work of the enterprise. The scrap is scattered over many points of the Mexican railroad's system.

Weakness at Cincinnati

Cincinnati, Aug. 7.—The scrap market does not seem to be able to shake off the lethargy that has been so marked for the past six weeks. Prices are weak and some recessions have been made within the past few days. Buyers are taking scrap previously bought as fast as it can be shipped, but are not making any new contracts. Wrought scrap is not in great demand.

Dealers More Cheerful

Pittsburgh, Aug. 7.—Scrap dealers appear to be more hopeful about the future. While quotations on most grades of material continue to recede gradually, it is believed more generally that an active buying movement will be enjoyed shortly. The more important mills have not figured in the market to any extent for more than 30 days; the consumption of scrap is as heavy as ever, and stocks are described as low. Dealers say prices will advance sharply just as soon as an active buying movement is under way. Heavy melting steel, which commanded $47, delivered, about 60 days ago, now is available at $33, and reports of sales at $30 are heard. Other grades have declined similarly in price since June 15. Low phosphorus steel scrap is being held at about $45. Machine shop turnings and borings are being held at $20 to $23, delivered.

Some Grades are Higher

Buffalo, Aug. 7.—Heavy sales of carwheels during the past week for Pittsburgh delivery on a basis of $56 per gross ton, Buffalo, have featured the scrap market. This has resulted in raising the price of car wheels from $33 and $35 to $35 and $36. Railroad malleable likewise has figured in the sales and the price of this grade has advanced from $30 and $31 to $33 and $34.. Embargoes in the Pittsburgh and valley districts still remain in effect, holding back shipment to these points. A considerable tonnage of heavy melting steel scrap was under inquiry during the latter part of the week from a local user for delivery over the next three months, but the transaction has not been consummated.

Market Sags Heavily

Cleveland, Aug. 8.—Scrap dealers characterize the local market as dead. There is no buying by consumers and a little trading between dealers and scattered purchases by short interests are the only evidence that a scrap market exists. Some dealers state that the crux of the situation is in Washington, and until it is definitely known what the attitude of the government will be with regard to prices, little will be done. Railroads holding material in yards, waiting for a favorable time to sell, have suddenly appeared as sellers and have been willing to take sharply shaded prices for old material. Inquiries are slack and offers of $30 and $31 are being made for heavy melting steel, Cleveland, without attracting buyers' interest.

Report Better Undertone

Birmingham, Ala., Aug. 7.—While dealers in old material assert there is a slightly better undertone the drop in quotations continues. With but two or three exceptions, all grades have declined further in the week. New demand is light. Old steel axles have held their own around $33 to $35, and one or two other grades are little changed, but in the main reductions have ranged from $1 to $1.50. There is considerable material in stock.

Pig Iron Output Continues to Fall

July Production Was 1000 Tons Less Per Day Than June Record—Output in First Week of August Drops Sharply—More Stacks Are Being Relighted

PIG IRON production records for July, just compiled, show that the slight decline in output which began in May, is continuing. In May, the blast furnaces produced on an average 800 tons less daily than in April; in June, 1440 tons less than in May, and in July, 1000 tons less than in June. The decline last month from the June total was slightly less than 1 per cent.

MONTHLY PRODUCTION.

	1917.	1916.	1915.
Jan.	3,159,839	3,171,878	1,591,024
Feb.	2,649,935	3,078,548	1,666,592
Mar.	3,255,813	3,327,630	2,046,280
Apr.	3,319,809	3,225,496	2,114,518
May	3,413,677	3,364,584	2,255,157
June	3,260,234	3,213,818	2,369,932
Total 1st half	19,059,307	19,381,954	12,043,503
July	3,337,442	3,221,127	2,563,311
Total 7 mths.	22,396,749	22,603,081	14,606,814
Aug.	.....	3,197,838	2,774,825
Sep.	.....	3,208,041	2,834,342
Oct.	.....	3,508,180	3,120,340
Nov.	.....	3,317,805	3,035,235
Dec.	.....	3,184,178	3,201,605
Total 2d half	.....	19,637,169	17,529,658
Grand total	22,396,749	39,019,123	29,573,161

Early indications are that production this month will be curtailed still further. Reports from Pittsburgh indicate that some of the furnace companies there have lost a high per cent of their capacity so far this month, owing partly to unfavorable weather conditions. In the Chicago district a number of furnaces are banked.

While the total production of coke and anthracite pig iron in July showed a gain of 77,208 tons over the June figure, there was a loss of 1016 tons in the daily average production. The total production of coke and anthracite pig iron in July amounted to 3,337,442 tons, and for June 3,260,234 tons, while the average daily output in July was 107,659 tons, compared with 108,675 tons in June. The tonnage gain was made by the steel works or nonmerchant furnaces. A total of 2,394,235 tons was produced by these furnaces in July, a gain of 69,837 tons over the June figure of 2,324,398 tons. As July has one more day, the daily average production of the nonmerchant stacks shows a loss of 247 tons. The steel works stacks produced 77,233 tons daily in July, compared with 77,480 tons daily in June.

The loss in the total tonnage produced by merchant furnaces amounted to 3651 tons, these stacks producing 889,700 tons in July, compared with 893,351 tons in June. The daily average output of the merchant furnaces in July was 28,700 tons, compared with 29,778 tons in June, a loss of 1078 tons.

The production of spiegel in the month of July was more than double that of June. In July, 19,894 tons of spiegel were produced, a gain of 10,455 tons over the June total of 9439 tons. While the output of ferro continues to show an increase, the gain for July was only 567 tons. The ferro production for July amounted to 33,613 tons, compared with 33,046 tons in June.

There were 351 stacks blowing on July 31, compared with 347 on June 30. The July total of active stacks is the largest which has been recorded for years. Seven merchant furnaces were blown in and three blown out, making a net gain of four. Six steel works furnaces were blown in and six were blown out, during the month.

The following merchant stacks were blown in during July: Northern, Northern Iron Co., July 6; Star, Star Furnace Co., July 30; Bird Coleman E., Bethlehem Steel Co., July 5; Lebanon Valley, Lebanon Blast Furnace Co., July 2, and Rome, Matthews Iron & Steel Co. The merchant stacks blown out were: Wharton No. 1 and No. 2, Wharton Steel Co., and Susquehanna No. 3, Rogers-Brown Iron Co., July 12.

AVERAGE DAILY PRODUCTION.

	1917.	1916.	1915.	1914.	1913.
Jan.	101,930	102,319	51,323	60,624	89,929
Feb.	94,641	106,157	59,521	67,450	92,095
Mar.	105,026	107,343	66,009	75,534	89,123
Apr.	110,936	107,517	70,484	75,383	91,812
May	110,119	108,535	72,747	67,646	90,865
June	108,675	107,127	78,998	63,486	87,229
July	107,659	103,907	82,687	63,075	82,525
Aug.	.....	103,156	89,510	64,403	81,839
Sept.	.....	106,935	94,478	62,757	83,137
Oct.	.....	113,167	100,656	57,007	81,933
Nov.	.....	110,593	101,174	50,042	74,322
Dec.	.....	102,715	103,278	48,236	63,746
Av'ge	105,645	106,610	81,022	62,934	83,980

The steel works stacks blown out during July were: One Bay View, and one South Works, Illinois Steel Co.; Steelton No. 4, Bethlehem Steel Co., July 27; one Eliza, Jones & Laughlin Steel Co.; Monongahela No. 2, National Tube Co., July 9; and one Atlantic, Republic Iron & Steel Co., July 6. The following steel works stacks were relighted: One Gary, Indiana Steel Co.; Steelton No. 3, Bethlehem Steel Co., July 20; one Cambria, Cambria Steel Co., and one Edgar Thomson, one Isabella and one Neville Island, Carnegie Steel Co.

One of the stacks of the Minnesota Steel Co., at Duluth, Minn., will be relined during August.

The Delaware River Steel Co., Chester, Pa., is installing a Heyl & Patterson pig casting machine at its Delaware river furnace.

The blast furnace of the Oriskany Ore & Iron Corp., Lynchburg, Va., will be blown out on Aug. 4, for relining. After the furnace has been relined, it will be blown in on ferromanganese.

The Charles F. Elmes Engineering Works, Chicago, is completing an erecting shop, 50 x 125 feet.

JULY PIG IRON

States.	No. of stacks.	No. in blast last day of month. July.	June.	Total tonnage made Merchant.	Non-Merchant.	——Totals—— July.	June.
Pennsylvania	158	138	135	275,622	1,035,601	1,311,223	1,281,081
Ohio	77	72	71	189,721	577,197	766,918	737,458
Alabama	46	33	32	147,318	82,539	229,857	234,190
Virginia	22	12	12	40,557	.....	40,557	42,539
New York	26	21	21	68,820	123,369	192,189	191,898
New Jersey	6	2	3	18,237	.....	18,237	13,176
Illinois	24	21	22	47,682	249,032	296,714	297,726
Colorado	6	4	4				
Indiana	13	13	12	27,612	263,652	291,264	280,290
Maryland	4	4	4				
Wisconsin	6	4	5				
Kentucky	7	4	4				
West Virginia	4	4	4	40,702	40,259	80,961	82,270
Tennessee	17	11	11				
Washington	1	0	0				
Georgia	2	1	0				
Texas	3	0	0				
Minnesota	3	3	3	33,429	22,586	56,015	57,121
Michigan	3	3	3				
Missouri	1	1	1				
Spiegel—All states						19,894	9,439
Ferro—All states						33,613	33,046
Totals	429	351	347	889,700	2,394,235	3,337,442	3,260,234

Steel Price Policies Vary

War Department Pays Practically Open Quotation for Rails But Navy Wants Cost Basis to Determine

Washington, Aug. 7.—The war department has made no announcement of the price it is paying for rails for tracks to be laid in France to transport American troops, but it is understood that the figure is close to $40 a ton, mill. The $40 price is the regular open quotation for open-hearth rails and while the order of the government calls for either bessemer or open hearth, it is understood a large tonnage of the latter will be furnished.

In accepting the rail price the war department apparently is pursuing a different policy than the navy department in steel purchases. The latter has resorted to provisions in the existing naval act and in the recently enacted urgent deficiency law which makes it obligatory that industrial plants give preference to the government in the matter of filling orders. Moreover, it is provided that the profit which shall be "reasonable" is left to the determination of the government. Operating under this plan, the navy department has placed some sizeable rail, plate, bolt, pig iron and other tonnages. The contracts name prices to be paid by the navy department, but make them only tentative, and subject to later determination. In the event the department concludes the price is too high, the difference over the definite sum fixed upon is to be refunded to it. On the other hand, if the department finds the price to be too low, then the difference over the sum fixed is to go to the producers. In the case of open-hearth steel rails, recent orders placed by the navy department name a tentative price of $35 a ton. Orders for bolts have been placed on the same basis at 5c, and for splice bars at 3.25c per pound.

The matter of determining a fixed policy as to prices for steel products will not be definitely announced until the federal trade commission has made its report as the result of its investigation into the cost of production in the steel industry. At the offices of the trade commission it was asserted that the investigation will be completed and the report made direct to the President soon, perhaps in two or three weeks.

Incorporated with $500,000 capital, the Dreadnaught Motor Machine Co., Lynchburg, Va., has been organized as a manufacturer of modern street-cleaning machinery and motor-driven pick-up sweepers, and will erect a factory with modern equipment. Construction work will be started as soon as the preparatory work of standardizing its machines has been completed. Following are the officers of the new company: President, J. N. Keyser; vice president, R. O. Brannan; secretary, B. E. Hughes; treasurer, R. D. Martin; directors, C. A. Hancock, C. N. Hancock and E. H. Hancock.

Government Buying

Continues to Feature Pipe Market—Municipal Lettings Are Few

Pittsburgh, Aug. 6.—Manufacturers of tubular goods are furnishing large quantities of material for the various cantonments. It is not known, however, exactly how much tonnage has been distributed by the committee co-operating with the council of national defense. Demand for boiler tubes and seamless tubing continues very heavy. Marine boiler tubemakers are paying attractive premiums for prompt delivery. The government and private interests have been active factors in the market for seamless tubing for camp and hospital beds. Orders for 50,000 steel hospital cots recently were placed. No large inquiries have come out this week for iron or steel pipe.

Government Takes Much Pipe

Chicago, Aug. 7.—The outstanding feature of the cast iron pipe market continues to be government requirements for cantonment construction. To expedite this work, the government is requisitioning whatever stocks are in foundry yards and also material ready for shipment to cities. The United States Cast Iron Pipe & Foundry Co. has taken something over 1500 tons for cantonment at Rockford, Ill., and a larger tonnage for Fort Riley, Kans. Bids were to be opened Aug. 6 at Akron, O., for 2500 tons of 4 to 30-inch. Bids were to be opened Aug. 7 at Michigan City, Ind., on 60 tons and at Lincoln, Nebr., Aug. 6, on 200 tons.

Public Awards Few

New York, Aug. 7.—R. D. Wood & Co. were low bidders on the 1227 tons of 6, 8 and 12-inch pipe for the department of water supply, gas and electricity, New York City, this week. Public lettings continue few and far between. Private buying, in comparatively small lots, is on the increase, makers report. The prevailing high prices and the recent hot weather have been discouraging extensive activity in the cast pipe market. No new awards of pipe for cantonments or military camps have been reported during the past week. No action has been taken on the lot of 3000 tons recently asked for export to Holland, or on any other export inquiry involving several thousand tons for France. Prices are unchanged at $55.60, New York, for 6-inch, class B, and $68.50 for 4-inch, class B.

Prominent Eastern Iron Firm is Dissolved

Philadelphia, Aug. 8.—The partnership of Pilling & Crane, Philadelphia, one of the most widely known firms identified with the iron trade of the east, has been dissolved, effective Aug. 1. It is understood Mr. Pilling will continue the business under the firm name of Pilling & Crane.

The partnership of Pilling & Crane was organized in 1892 by William S. Pilling and Theron I. Crane. Previously Mr. Pilling had been identified with the production of pig iron in eastern Pennsylvania, from 1872 to 1890 with the Crane Iron Co., finally as treasurer. From 1890 to 1892 he was connected with William R. Hart & Co. Mr. Crane had also been associated with eastern pig iron interests. The firm of Pilling & Crane organized the Northern Iron Co. with Mr. Crane as president and Mr. Pilling as secretary and treasurer. The Northern company has two furnaces in New York state, one at Port Henry, N. Y., and the other at Standish, N. Y. Messrs. Pilling and Crane also have been identified with the Warwick Iron & Steel Co., the Eastern Steel Co., the Benson Mines Co., the Northern Zinc Co. The firm has acted as sales agent for a number of eastern Pennsylvania blast furnaces. Mr. Pilling for years has been the secretary of the Eastern Pig Iron Association.

Will Continue Selling

The Diamond Chain Co., York, Pa., Samuel M. Horn, president, a controlling interest of which recently was acquired by the Rowe Calk Co., Plantsville, Conn., will continue the sale of its product in the open market as heretofore.

The American Steel Export Co., Woolworth building, New York City, has appointed Woodburn's, Ltd., Montreal, Can., as its exclusive agent for the provinces of Ontario and Quebec.

Speeds Up Price Policies

President Urges Trade Commission to Complete Cost Finding—Steel Investigation Delayed—Allies to Get Same Price

Washington, Aug. 7. (By wire.)—As the result of conferences which President Wilson just had with the federal trade commission, the war industries board, the council of national defense and the department of justice, it is expected that definite action will be taken soon regarding the policy of the government as to purchases of supplies for itself and its allies. It is believed that the war industries board may be given power, through legislation said to be contemplated to make purchases and to name price.

The conference which the President had with the federal trade commission related to investigation that body has under way with regard to the cost of producing steel, copper, coal, aluminum, coke, zinc, lead, cement and petroleum. The President is understood to be anxious to have the commission complete its investigations and lay them before him at the earliest possible time so that a uniform policy as to purchases of supplies and prices both for United States and its allies may be fixed. The copper report is almost ready, and this will be followed by one on coal.

The commission is making slow progress, according to report, in its steel investigation. Its difficulties are due to the fact that it is finding the costs in different mills vary widely. The commission will make report direct to the President, who will name the prices to be fixed. There is considerable speculation as to whether the prices be placed on graduated scale according to the individual costs of the different mills or an attempt will be made to name uniform figures for the same product. It is believed in any case the prices will be made for this government and its allies only and not for general public.

W. I. Babcock Dies

Washington Irving Babcock, a naval architect and engineer of national repute and senior partner in the firm of Babcock & Penton, naval architects, died suddenly at his home in New York, Aug. 7. Mr. Babcock was born at Stonington, Conn., Sept. 26, 1858. He was educated in the public schools of Brooklyn and was graduated from Brooklyn Polytechnic institute in 1878. From 1878 to 1885 he was employed by Morgan's Iron Works, New York; from 1885 to 1887 at Roach's shipyard, Chester, Pa., and from 1887 to 1889 he was superintendent of the Union Drydock Co., Buffalo, resigning that position to become manager of the Chicago Shipbuilding Co. Mr. Babcock was elected president of the latter company in 1899 and filled that position for two years, leaving that company to form the firm of Babcock & Penton.

Place More Nails

For Various Regular Army Cantonments—75,000 Kegs Now Purchased

Cleveland, Aug. 7.—Further orders for wire nails for federal army cantonments were placed during the past week as it was found that requirements covered by orders closed several weeks ago were underestimated. For Chillicothe 2650 kegs additional were placed. Bolt manufacturers in this district have been inquiring for lots of wire to cover last half requirements, but no business yet has been closed. Makers continue to sell very cautiously, though, as far as possible, they are endeavoring to prevent their regular customers suffering from lack of material. Independent makers still hold nails at $4, Pittsburgh, per keg. Some inquiries for strip steel for aeroplane wheel rims have been put out in this district.

Prices are Unchanged

Pittsburgh, Aug. 7.—The sub-committee on wire of the American Iron and Steel Institute appears to be the only buyer of wire products in a position to obtain nails at $3.20 a keg from all makers. About 75,000 kegs of nails have been purchased from the American Steel & Wire Co. and independent makers at that price, which is the "official" price of the leading interest. Independent makers, however, continue to quote nails at $4 a keg to domestic consumers; that price was adopted June 15 last. The American company has made no changes in its prices since March 5, when it advanced quotations $4 a ton to $3.20 for nails. Specifications are heavy, but little new domestic demand exists.

Imports of iron and steel into Tasmania for the three months ending March 31, 1917, were valued at $8010, with the United States and the United Kingdom as the chief sources of these products. Machinery and implements valued at $25,861 were imported from the United States, against $35,379 from the United Kingdom. The value of imported metals and manufactures thereof was $12,463 and $47,798 for the United States and the United Kingdom, respectively. Importations of all kinds totaled $1,116,841 for the three-month period.

Charcoal Iron Co. Reports Good Order Book

Unfilled pig iron orders of the Charcoal Iron Co., Detroit, during the remainder of 1917 amount to 64,743 tons at an average selling price of $27.24, at the furnaces, according to an announcement made to stockholders by Frank W. Blair, president of the company. President Blair also states that the company has sold 45,985 tons of pig iron for delivery in 1918 at an average price of $42.19. Net profits of the company for the quarter ended June 30 were $527,524, against $364,992 for the first three months of the year, an amount equal to $7.46 per share on the common. The surplus of the company has increased $474,275 since Jan. 1. At present the company has a surplus of $1,487,627, after deducting dividends and income taxes. Expenditures for new construction during the last quarter amounted to $783,146.

Promotions Announced

W. J. Longmore, purchasing agent of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been made general purchasing agent of the company and will be transferred from East Pittsburgh to Pittsburgh. He has been with the Westinghouse company since 1881 and has been purchasing agent since 1892. Charles G. Taylor, formerly assistant purchasing agent, has been promoted to the position of purchasing agent at East Pittsburgh. Mr. Taylor has acted as assistant purchasing agent since 1895. A. W. Fullerton, formerly purchasing agent of the Westinghouse Machine Co., East Pittsburgh, has been appointed purchasing agent of the works at East Pittsburgh, Trafford City and Essington, Pa.

Cincinnati Gets Meeting

Cincinnati has been selected as the meeting place for the fall session of the American Iron and Steel Institute and the dates will be Oct. 26 and 27. Headquarters will be at the Hotel Sinton.

Ore Shipments Gain

Movement of Lake Superior Ore Now Only 3,000,000 Behind 1916

Iron ore shipments from the Lake Superior district up to Aug. 1 are slightly less than 3,000,000 tons behind the record set in the same period last year. The 1917 loss was cut down sharply in July, when the lake fleet moved 10,241,633 tons, which was 491,476 tons more than the movement in July, 1916. The size of the movement last month proved a surprise to many, as serious delays at lower lake unloading docks were encountered all month due to insufficient car supply.

The goal of 60,000,000 tons for the season, which it is figured will carry the blast furnaces over the closed season of navigation, seems certain to be reached. To move this total, the fleet must carry 34,000,000 tons in the next four months.

The July shipments easily surpassed the record for any other month, the fleet for the first time moving more than 10,000,000 tons in one month. The detailed shipments follow:

Shipments

Port	July	To Aug. 1
Escanaba	932,274	3,137,571
Marquette	643,887	1,269,636
Ashland	1,238,326	3,147,794
Superior	2,231,502	5,757,584
Duluth	3,543,873	8,672,767
Two Harbors	1,651,771	4,391,416
Total	10,241,633	26,376,768
1917 increase	491,476	.....
1917 decrease	.....	2,988,956

Ore receipts at Lake Erie ports, as shown by the records of *The Marine Review*, were 7,651,882 tons, or slightly in excess of the record in the same month last year. Shipments from docks to interior furnaces were 5,146,355 tons, while the balance on dock Aug. 1, was 5,719,481 tons against 4,810,671 tons on Aug. 1, 1916. The receipts by ports follow:

Port	Gross tons
Buffalo and Port Colborne	1,250,309
Erie	271,228
Conneaut	1,484,016
Ashtabula	1,474,460
Fairport	375,551
Cleveland	1,452,898
Lorain	685,168
Huron	244,082
Toledo	362,904
Detroit	51,266
Total	7,651,882

New Owners Put Riverdale Mill in Operation

Chicago, Aug. 4.—Purchase of the Riverdale rolling mill, Riverdale, Ill., has been made by E. B. Lanman & Sons, who have been operating a bolt, nut and washer plant at East Chicago. The Riverdale Rolling Mill Co., a new corporation, has been formed by E. B., A. J. and C. B. Lanman, to operate the mill. Under the style of E. B. Lanman & Sons, the same parties have operated the East Chicago plant for several year. An additional puddling furnace will be added to the Riverdale plant, increasing its capacity to 25 or 30 tons per day. The plant is equipped with a 10-inch mill, and operations for the rolling of bar iron have been instituted. Steel bars may be rolled on occasions. The Riverdale mill was built in 1908 by the Riverdale Iron & Steel Co., and was leased to the Chicago-Riverdale Iron & Steel Co. in 1911. It was closed late in that year, and has not been operated since. It was bought in 1914 by the Armour Steel Co.

H. L. Kaufman Resigns

H. L. Kaufman has severed his connection with the firm of E. N. Breitung & Co., Cleveland. The firm is a large producer and shipper of Lake Superior ore, largely from the Marquette range. Mr. Kaufman, it is understood, will engage in the banking business in New York.

Many Kegs

Of Wire Nails Shipped to Camps—Chester Shipbuilding Is Sold

New York, Aug. 8. (By wire.)—About 85,000 kegs of nails already have been shipped on government orders to cantonments out of a total of 120,000 kegs distributed. The cantonment orders were placed June 21, and the camp orders July 21.

Harrigan interests have acquired the Chester Shipbuilding Co. and will construct 12 ways at Bristol, Pa. It is reported the government has placed 100,000 kegs of spikes for France.

The Illinois Central railroad has given contracts to the Railroad Water & Coal Handling Co., of Chicago, for a 500-ton coaling station of automatic bucket type at Lambert, Miss., and a 300-ton station of the same design at Durant, Miss.

The Non-Ferrous Metals

Copper Lead Spelter Tin

New York, Aug. 7.—The metal markets remain virtually dormant, with prices generally holding steady. Within the past 24 hours, spelter appears to have taken a brace and early in the week the flurry in copper subsided, but aside from this the situation shows little change. One development during the past few days worthy of note has been the announcement that the government would receive bids through the zinc committee, Aug. 10, on 11,500,000 pounds of grade C slab spelter for delivery over the next 10 months. This is a departure from the usual method, which was to settle on a definite price with the zinc committee instead of going into the open market. The specifications for the spelter involved in this inquiry call for a somewhat better grade than that of ordinary prime western, and place it in the class of prime western special.

The week in copper has been quiet. Prices, following the recent small flurry, have again subsided, and at this time may be quoted nominally as follows: Electrolytic, spot, 28c to 28.25c, cash; August, 27.75c to 28.25c, September, 26.75c to 27c; and fourth quarter, 26c to 26.50c. The market on lake copper is hard to define owing to the great scarcity of offerings, but may be quoted nominally at 29.50c to 30c, cash. The differential between casting and electrolytic copper, which ordinarily is around 2c, has narrowed perceptibly, casting copper for prompt delivery now holding 27.50c to 28c, cash, New York.

Prices on prime western spelter, which have been holding firm around 8.50c, St. Louis, throughout the greater part of the week, have advanced under pressure of increased demand. As yet buying is not of large volume, but inquiries have become more numerous. The market on prime western today follows: Prompt and August, 8.62½c to 8.75c; September, 8.75c; and last quarter, 8.75c to 8.87½c, St. Louis.

The lead market remains relatively quiet, pending an official announcement by the government regarding its August requirements. It is understood, however, that negotiations on this order are virtually completed, and that some producers have been advised to furnish the same amount to the government as they did in July. This latter report may be taken to indicate that the amount for this month will be 8000 tons, or equal to the tonnage taken last month. It is also believed that the price involved will be the same; the last figure was 8c. The leading producers continue to quote 10.92½c, St. Louis, on current contracts, while the outside market as a whole quotes 10.62½c to 10.87½c, St. Louis.

Tin during the past week has been very firm at 63.75c, New York, for Straits for spot shipment. Supplies of Straits are scarce and the situation generally is strong, despite the fact that demand is quiet.

Aluminum also is dull in the outside market. Domestic consumers are buying only for their immediate needs, and the demand from abroad is small. No. 1 virgin in carload lots for prompt shipment may be quoted today at 51c to 53c; No. 1 remelted, 49c to 51c; and No. 12 remelted, 39c to 40c.

Demand for antimony appears to have improved during the past week, causing prices to advance to their present levels: Spot and August, 15.50c to 15.75c; September, 15.75c, duty paid.

The Possibilities of Briquetting

The Advantages Gained by Briquetting Coal, Coke Breeze, Flue Dust, and Steel, Iron, Brass and Aluminum Scrap—Various Types of Equipment and Different Methods Described

BY A. L. STILLMAN

THE term "Briquetting" is not easy to define. The popular impression confines the process to the manufacture of fuel dust into a shape more convenient for handling than burning; but the scope of this comparatively new engineering specialty is far wider. At the risk of criticism the following definition of briquetting is ventured. "Briquetting is the process of fabricating small or fine materials, the breakage or wastage from larger blocks of the same nature, into larger sizes more convenient for the purpose in hand, that purpose involving the destruction of the product or briquette as such, either by useful consumption or as a step in a melting or reducing operation."

The latter part of the definition indicates the true difference between the brick and the briquette. The brick is an article of manufacture destined to a use which is practically long lived, as in furnace arches, buildings, and pavements. The briquette, on the other hand, is always destined to a furnace operation wherein its usefulness is realized rapidly.

Briquettes manufactured for the rebagasse, chaff, peat, lignite, anthracite production of heat include sawdust, and bituminous coal, coke breeze and such mixtures. Those made to secure economy in reducing and melting are divided into three groups: Metal scrap, including cast borings, steel turnings, brass, bronze, aluminum, tin and zinc scrap; mineral ores, including zinc, tungsten, iron, copper, mercury, etc., and by-products which include blast furnace flue dust, drosses, oxides, etc. This classification does not take into consideration rubber, paper and scrap of similar nature which are not considered good briquetting material.

The matter of binding material and consequent treatment has resulted in a difference of opinion that has divided the coal briquetting industry into two great schools, namely, persons advocating the hard pitch method, and those advocating the use of the more viscous hydrocarbons. It is universally admitted, however, that a binding material is necessary with practically all fuels.

The two methods of briquetting, namely the hard pitch and the viscous hydrocarbon, involve two totally different methods of preparation. Both may be applied to bituminous coal, anthracite, coke breeze and their mixtures. The disadvantages of using pitch under any circumstances, lies in the smoke and odor produced by this binder. For power purposes where a certain amount of smoke is not objectionable, there is a ready market. The coal operator who prepares his slack material to meet retail trade conditions requires a binder wherein the smoke and odor nuisance is reduced to the very minimum. Wherever a binder is necessary some method of preparation to secure proper mixing of the fine material and binder is also essential. In the hard-pitch process the preparation consists of cracking, proportioning, mixing and heating. Where low-melting hydrocarbons have been used, the process has simply involved melting the binder, paddle mixing and finally pressing.

In the Dutch oil process, the addition of a heavy crushing action upon the coal-oil mixture results in certain physical and chemical phenomena that vastly improve the final product. Although this process can be used with any comparatively viscous tar and pitch as a binder, it is the policy to use the comparatively smokeless heavy oils, especially for the domestic market. The first step in the process is the drying, usually done by a rotary shell type dryer at between 400 to 500 degrees Fahr. Meanwhile the oil is melted and pumped through a strainer and along a steam jacketed line to a feeder tank. The pipe line

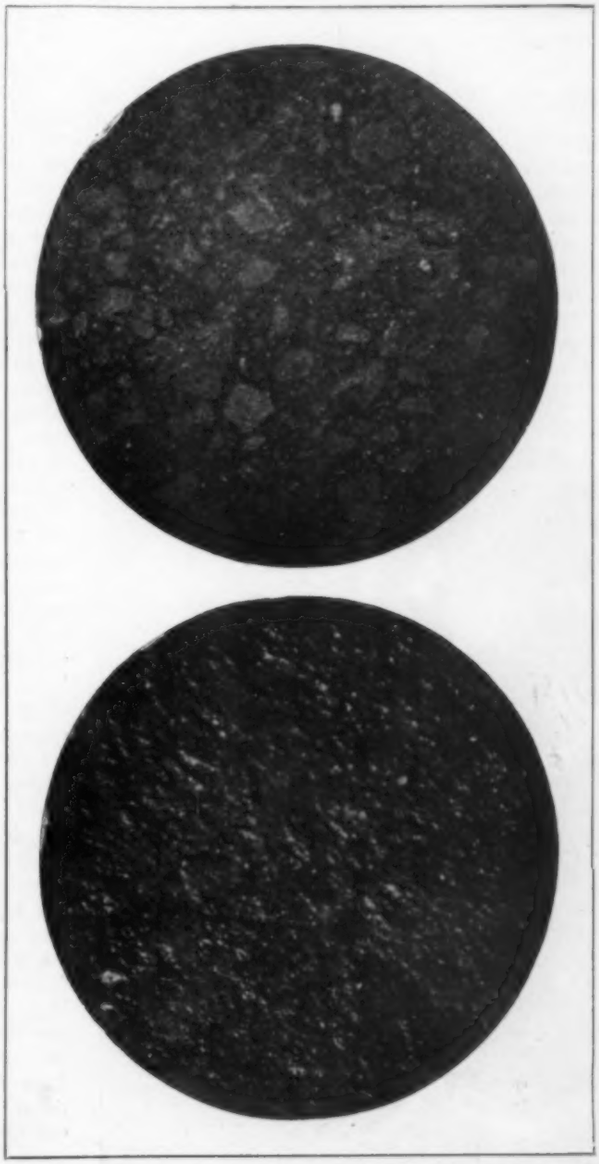


FIG. 1—PHOTOMICROGRAPH OF COAL BRIQUETTED WITHOUT MASTICATOR

FIG. 2—PHOTOMICROGRAPH OF COAL BRIQUETTED BY DUTCH OIL PROCESS

The author, A. L. Stillman, is assistant to the president, General Briquetting Co., New York.

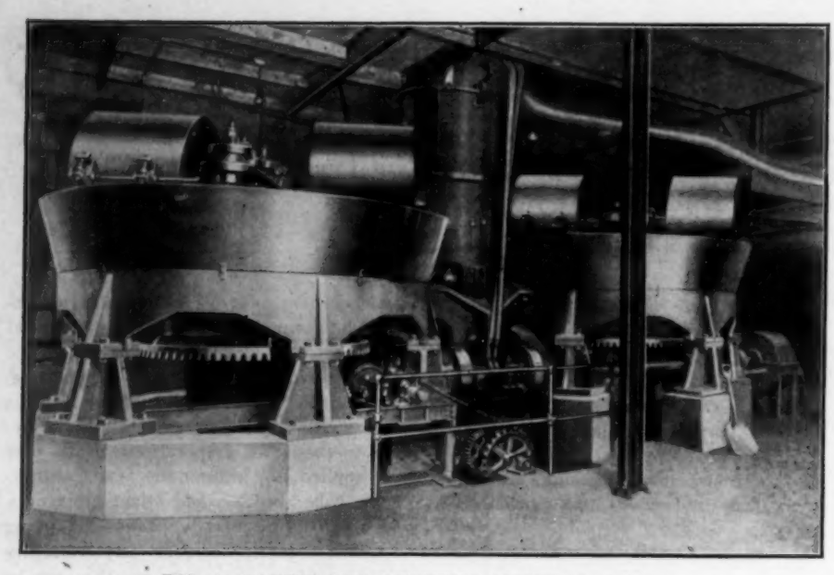


FIG. 3—MASTICATOR SHOWING MOVABLE ROLLS

from the feeder tank takes the oil to the paddle mixer where it is mixed with the coal in the proportion of 5:95. The correct proportioning is a matter of individual judgment, the object being to use as little binder as possible consistent with the proper working of the process. A fair degree of thorough mixing is obtained by the paddle mixer but the real intercompounding is done in the masticator with movable rolls as shown in Fig. 3. The masticator is a Chilean mill or pan grinder with stationary pan and huge movable rolls with scrapers between. Here the plastic flux is thoroughly ground. The sticky mixture of oil and coal goes to the masticator, and comes out a dry plastic mass, each grain of coal so intercompounded with oil that the resulting flux might be called a new hydrocarbon compound.

From the masticator the flux is conveyed to the feeding box and thence to the press. From the press the briquettes are taken to a cooling device, then screened and delivered to the cars. Fig. 2 shows the close bond between the coal particles obtained by the use of the masticator, and Fig. 1 shows the structure of the coal particles resulting from ordinary mixing.

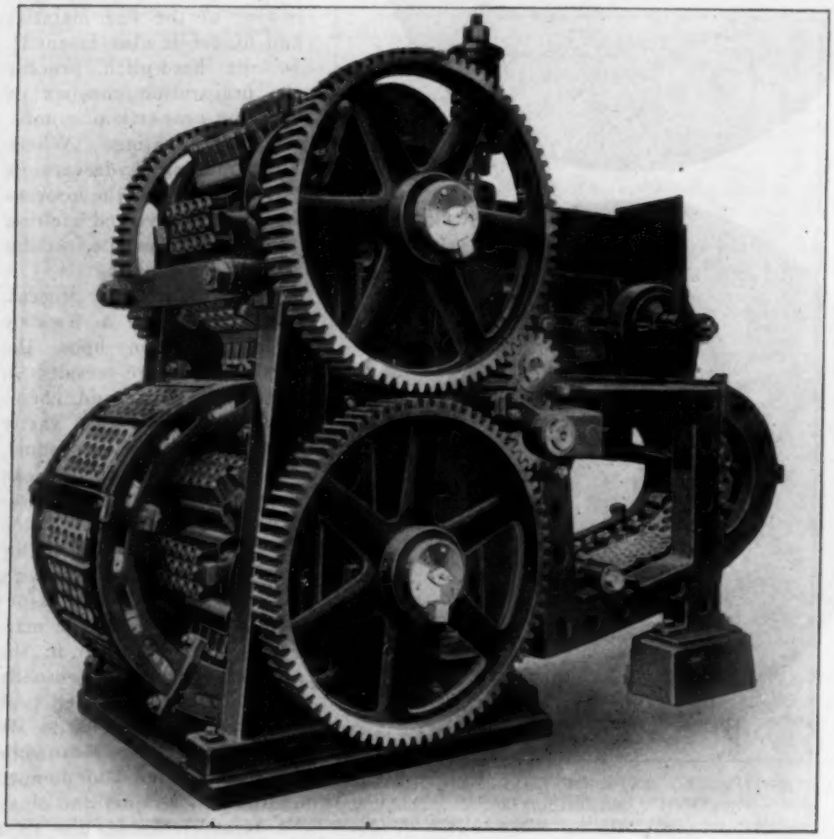


FIG. 4—RUTLEDGE BRIQUETTING PRESS

The Rutledge briquetting press, shown in Fig. 4, is of the continuous mold type and consists essentially of a chain of molds or die plates, passing under a feeding hopper and between two revolving drums, upon which punch rams are carried. Two pilot punches on each punch ram engage the die plates in advance of the entrance of the punches into the dies; these pilot punches not only serve to move the dies forward, but insure perfect alignment of the dies and punches. The lower punches enter the dies again at the lowest point of their travel, and eject the briquettes.

There is now a widespread investigation of briquetting high volatile bituminous coal, cannel and lignite. There are vast deposits of these fuels, whose handling is difficult because of the high volatile content. It has been proposed that they be briquetted together with anthracite dust or coke breeze. Excellent briquettes can be made in this way with proper proportioning. When the material, especially the lignite, is briquetted alone there is considerable expense due to the removal of the high moisture content. Again, high volatile fuels, when briquetted, do not stand up so well in the fire as the denser coals because the light volatile gases, coming off at comparatively low temperatures, 600 to 800 degrees Fahr., cause the briquettes to disintegrate before they are consumed. On the other hand, the application of the Dutch oil process upon certain lignites resulted in a product which did not so disintegrate. Many authorities advocate the removal of at least a portion of the volatile content before using the fuel as briquetting material. This has been accomplished by the use of a rotary kiln dryer wherein a final temperature of 800 degrees Fahr. was realized.

Excellent briquettes are being made of coke breeze. To insure better kindling and burning qualities, it is considered good practice to mix the coke breeze with a certain proportion of soft fuel—bituminous coal, lignite or the like. Coke breeze, used alone, wears out the machinery very rapidly, especially the molds. Mixing with soft fuels remedies this difficulty. Proportionate mixing of fuel for briquettes can only be determined by local conditions. Generally speaking, 70 per cent coke breeze and 30 per cent bituminous coal is sure to make an excellent briquette.

The subject of mixtures in briquett-

ing is as wide and as interesting as the alloying of metals. Many possible combinations suggest themselves. Coke breeze and lignite open an interesting problem as briquette companions. Anthracite sweepings may be utilized in conjunction with other available fine fuel. While a great deal of work has been done in this line the field si still generally unexplored.

Metal Scrap Briquettes

Within the past few years, there has been another notable investigation in the briquetting field; namely, the pressing of fine metal scrap into large briquettes which in the furnace are designed to take the place of heavy metal scrap. In practically all metals, there is a large difference in price between the fine scrap, turnings, borings and the like and the relatively heavy scrap or ingot, due to the following reasons:

First.—Volatilization and oxidation. The light scrap presents so much surface to the air that in melting a large proportion of it is oxidized and thereby lost. The large amount of exposed surface also accounts for the fact that in many metals, notably zinc, tin and the like, a large proportion is vaporized and lost altogether.

Second.—Difficulty in handling. The large bulk of turnings, borings and the like render them extremely difficult to handle and to charge into a furnace. They occupy so much room that their use means the lowering of the capacity of all classes of melting furnaces. Transportation from long distances makes up a heavy item, as scrap material cannot be packed economically by ordinary methods.

In the case of longer turnings, it has for some time been a standard practice to make up bundles by means of bundling or cabbaging presses such as the Logemann. In this way the surface exposed to oxidizing action is very considerably reduced and a great economy frequently realized. Bundling, however, is only applicable to long, fairly pliable turnings. The manufacturers of bundling machines do not in any way claim to turn out a briquette from the short needles or borings that form such a large proportion of the usual machine shop scrap. The losses in melting down this material may all be summarized by the difference in price, in the case of each metal, between light scrap and heavy scrap. The difference is shown in Table I.

Methods Used For Metal

In the manufacture of metal briquettes there are two classes, namely, those whose briquetting should proceed without the use of binder or flux, and those whose melting flux should be briquetted with them. In the latter class we find the hard bronzes and the like which are briquetted with milk of lime or equivalent material. So little of this has been done, however, that the entire metal classification at the present time may be considered as being a problem in briquetting without binder. If it were possible, merely by applying heavy pressure, to get a good briquette there would be little of a technical problem involved. The fact is that the pressure or force must be so applied that the resulting briquettes do not contain chambers of air under compression. Briquettes made under impact or hammer blow unfortunately contain air in this state. When briquettes of this nature are melted the air, expanding, tears the briquette apart, thereby forfeiting all the economy anticipated.

The usual method comprises some adaptation of the hydraulic press. One such press is the hydraulic briquetting outfit which may be operated by either an independent pump or an accumulator system. This press is designed for 300-ton pressures and small capacities. The press is fitted with a cylindrical mold 40 inches in diameter and 20 inches deep. The press proper is a plain inverted type with a single auxiliary pull-back cylinder located above the main cylinder. Its operation is controlled by one 4-way poppet valve. The material is compressed into a compact briquette of uniform density. The briquette is removed by hydraulic pressure which causes it to fall through the mold to the base of the press, from whence it is removed by a conveyor. The mold is filled by means of the conical hopper attached at the top. The lever to the right and nearest the press, controls the lower part of the mold. No jack cylinders are required to lift the press mold, the springs being sufficient to bring it back to place.

The Ronay Process

At present there is a widespread and growing interest in the Ronay press which is designed for high capacity and high quality of briquette. The manufacturers claim that little is gained by the use of a hydraulic pressure above 30,000 pounds per square inch, but that everything depends upon how such a pressure is used.

This press, illustrated in Fig. 5, consists of six molds, 5 and 6 inches in diameter set in a horizontal rotary table. This table is automatically rotated 60 degrees between each operation, it being controlled by a hydraulic valve gear.

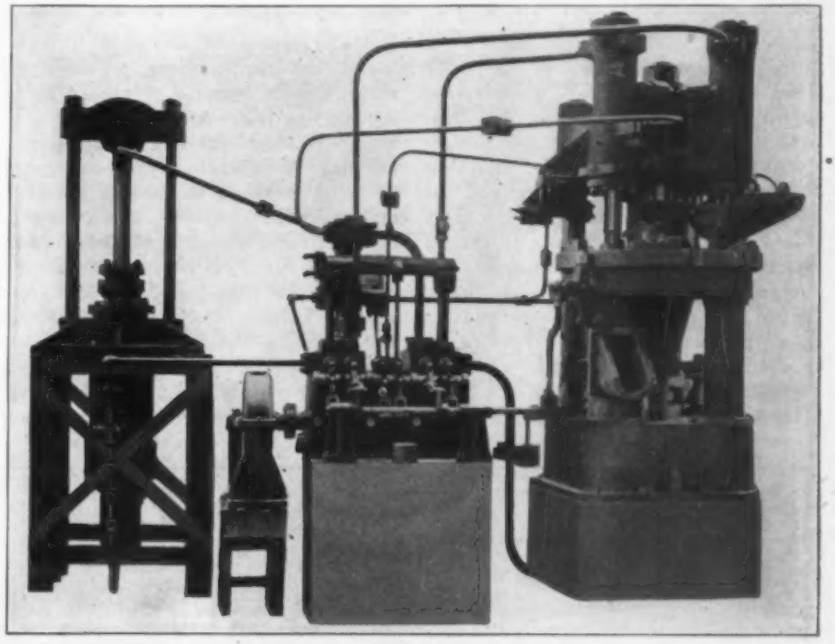


FIG. 5—RONAY PRESS DESIGNED FOR BRIQUETTING SCRAP METAL

Details of Operation

Three of the molds are simultaneously subject to the various operations of packing, full strength pressing and ejecting while the other three are idle. Each succeeding operation brings these three idle molds under the three pistons. In the first sector the mold is filled with chips from a filling hopper and the contents then subjected to the action of a hydraulic packing plunger working from above. The mold at the bottom is closed by a loose sliding plunger.

After the filling and packing is completed, a 60-degree revolution of the table brings the mold to the idle po-

Table I.

Comparison of Cost of Light and Heavy Scrap

Scrap	Price, cents per pound Heavy	Light	Difference per ton, dollars
Aluminum	.60	.23	740.00
Brass	.17	.14	60.00
Copper	.275	.24	65.00
Steel	.02	.01	19.00
Cast iron	.014	.01	11.50
Tin	.53	.70	260.00
Zinc	.082	.07	25.00
Lead	.102	.085	35.00

sition, where it awaits the filling of the succeeding mold. This completed, another 60-degree revolution carries it under the heavy pressure piston. The contents of the mold are directly under a stationary counterplunger and over a sliding plunger operated by a hydraulic piston. Pressure is slowly admitted by valve gear. The lower plunger is forced against the chips in the mold. The mold rises under compression, thereby avoiding friction of the chips against its sides. The counterplunger exerts a pressure practically equivalent to that of the lower plunger and the chips are thus compressed on both sides. A downward pressure is exerted against the mold by adjustment of counterweights which serves to assist the mold to retrieve. The slow building up of pressure allows the contained air in the material to be ejected and thus prevents a tendency to open.

Owing to the pulsating of the pump the lifting of the mold is somewhat spasmodic, resulting in a movement like shaking, facilitating the expulsion of the air. With the expulsion of the air the pressure is brought up to maximum which in the 5-inch molds amounts to 30,000 pounds per square inch. The pressure is held just long enough to insure a permanent set when it is released and the briquette is either removed by the operator or pushed up by a conveying belt. All through the operation, packing, pressing and ejecting are done simultaneously and when the rams are returned, the table is advanced automatically.

A Gillmore press, a horizontal type shown in Fig. 7, is of smaller size and capacity than the one just described and is adapted for smaller foundries and metal indusries. It is of a two-post horizontal construction. The cylinder end is of steel, outside packed, and designed for 4000 pounds per square inch hydraulic pressure on a plunger, 13½ inches in diameter. Two pull-back pistons, outside packed, are connected to the main plunger by means of a crosshead.

The head block of steel contains the mold, which is also of steel, bushed with hard iron. This mold has a 6-inch bore and is 12 inches long. A removable block located in the head block at the discharge end of the mold serves to close one end of this mold when forming a briquette. A 6 x 24-inch receiving hopper at the inside end of this mold is provided with a hinged cover, which when the hopper is filled with turnings, is closed and locked, forming a cylindrical receptacle for the turnings. The ram entering at the rear end of this cylinder thrusts the chips into the mold and ultimately forms a briquette therein. When the briquette is formed and the pressure has been released, the block, used only in briquetting bulky materials, is removed and by again applying pressure the briquette is removed.

A belt-driven sextuple pump is provided, having low pressure cylinders of 8.7 gallon per minutte, capacity of 1000 pounds per square inch pressure, and high pressure cylinders of 4.9 gallon per minute capacity at 4000 pounds per square inch pressure. This pump is provided with a combination check, a check valve which closes at 1000 pounds line pressure and a 1000-pound relief valve for the high pressure pump, all

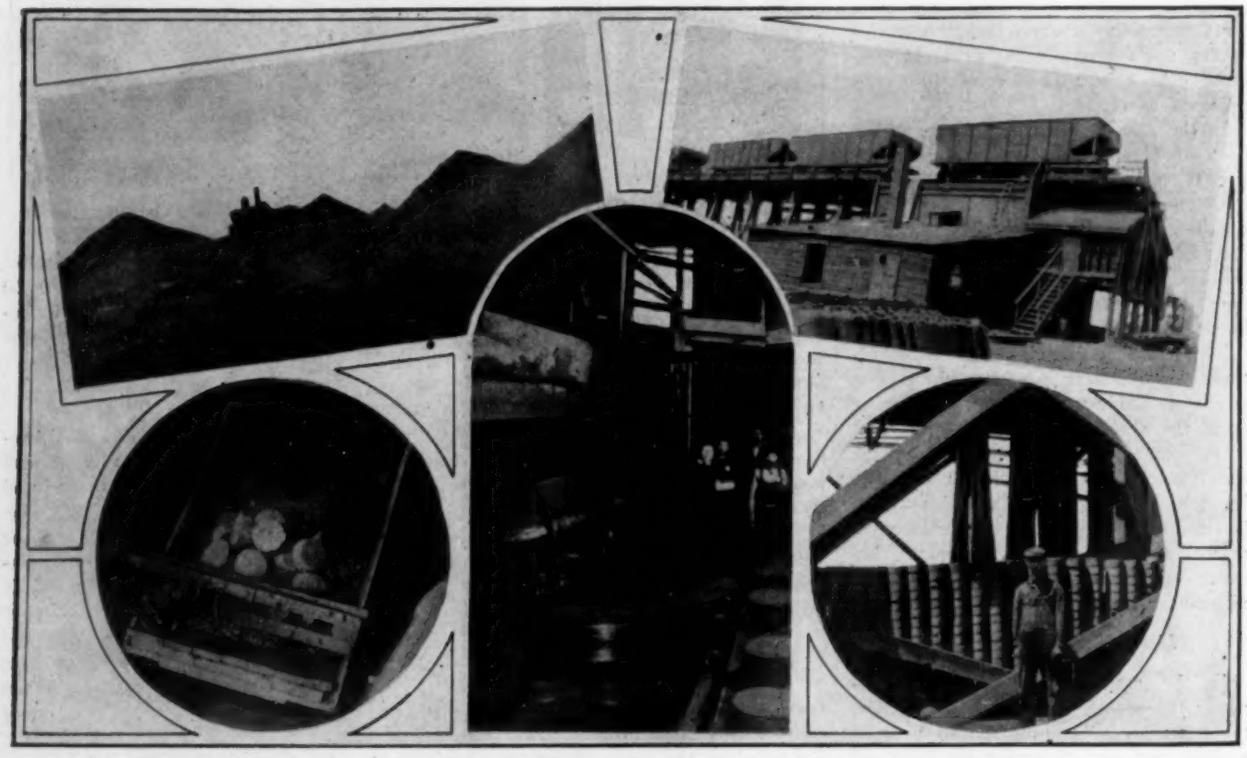


FIG. 6—VIEWS OF FLUE DUST BRIQUETTING PLANT, WICKWIRE STEEL CO.
Top view, left to right: Flue dust pile and briquetting plant—Lower view, left to right: Briquettes in furnace charge, press and storage

of which are simply emergency valves.

Suitable air bottles of 8 cubic feet or more capacity are provided. The bottles when no water is contained serve the purpose of an accumulator and are more efficient if under a pressure of 100 pounds per square inch or more of air. An automatic relief valve by-passes the low pressure pump freely when a pressure of 100 pounds has been attained in tthe air botttles. A 1000-pound spring relief valve by-passes the valve if it is not open. The operating valves are controlled by a single operating lever.

Iron Abstraction Necessary

In some cases a certain amount of preparatory treatment is necessary before the light metal scrap can be fed to the briquetting machine. In practically all cases where iron or steel in some form may be inadvertently mixed with brass or other nonferrous scrap, it is essential, for metallurgical reasons, to abstract the iron before making up the briquette. This separation is readily accomplished by magnetic separators which are widely used as preliminary to smelting where briquetting is not yet in use.

Table II.

Melting Loss

Manganese bronze:	Melting time	Loss in melting Pounds	Per cent
Loose	4 hrs. 20 min.	137	18.8
Loose	4 hrs. 30 min.	164	22.5
Briquette	3 hrs. 45 min.	62	8.5

Note: Each charge weighed 727 pounds. Crucible furnace with natural draft used. Fuel was hard melting coke.

Another problem arising in connection with the feeding of the presses is the great quantity of loose fluffy scrap of all kinds so bunched together that it is practically impossible to pass it through the feeding hopper. Where this material is soft and very malleable, a cutting operation may be necessary. In Europe a hopper has been designed whereby a series of revolving knives automatically cut this material into an ideal form for briquetting, short lengths of 1 or 2 inches. The cutting action is only recommended in the case of extremely soft metals. Generally the result can be easily obtained by crushing, in many instances a crusher being preferable to a cutter on account of the lower expense for upkeep and repairs. Where large quantities of scrap are used, a large breaker such as is illustrated in Fig. 3, gives excellent results. The ideal briquetting plant, especially for iron and steel, involves an installation of a masticator, shown in Fig. 3, the necessary conveyors, and two presses whereby a capacity of over 100 tons per day may be realized very easily.

Table III.

Melting Loss of Aluminum

Aluminum chips:	Weight in kilograms	Melting time in minutes	Wgt. after melt in kilograms	Melting loss Kilograms	Per cent
Loose	14.5	50	12.5	2.0	13.8
Briquettes	14.8	35	13.6	1.2	8.1

Note: Two per cent ammonium chloride added to briquettes as a flux.

PHYSICAL TEST OF METAL

Kind of bar:	Chips	Chips	Briquettes	Briquettes
Elongation in mm.....	0.8	0.8	1.2	1.0
Ultimate strength in kilos.....	2320.0	2120.0	2850.0	2800.0
Unit ultimate strength in sq. mm. per kilo	21.5	19.7	26.9	26.0
Per cent elongation.....	0.65	0.65	1.0	0.83

Briquettes generally have a density of 70 to 80 per cent with all ingot metal, depending on the pressure used. The fact that briquettes pile more compactly because of their shape than heavy scrap, more than makes up for this deficiency in density. The lighter specific gravity seems to tend toward a greater speed in melting.

In metallic briquetting four methods of melting must be considered. First, crucible melting which includes nonferrous metals; second, cupola melting which includes iron borings; third, open-hearth which includes steel turnings, etc.; fourth, electric furnace which includes iron and steel. The working of briquettes in the crucible and the saving effected by the briquetting of bronze is shown in Table II.

The saving in melting in this case amounts to 10.3 per cent or about $50 per ton at present prices. In addition there is a saving of 35 minutes in melting time which will appreciably increase the number of heats per day.

In the case of aluminum, there is hardly any doubt but that briquetting improves the character of the resulting metal in addition to the saving in melting time and melting loss. The melting loss, as shown in Table III, is only 13.8 per cent in the case of loose aluminum chips and it is well known that in many cases aluminum loss is as high as 30 to 40 per cent. Here a saving is shown of at least $40 per ton, which is extremely conservative.

Cast iron borings are eagerly sought by blast furnace operators as part of their smelting charge. It cannot be denied that such use for material of this nature is wasteful in the extreme. The proper place for the melting of cast iron borings is the cupola, although when charged directly, they lose approximately 50 per cent of their weight and often ruin the product. A great deal has been done and a fair success obtained in the boxing of borings for the melt. One method, for which considerable economy is claimed, is the loading of the borings into an iron pipe and gradually lowering into the melt, the pipe melting down with its contents. All these methods are subject to the criticism that any break will result in the borings running over the coke bed to the detriment of the following operations.

Economy of Steel Briquettes

In the case of steel briquettes, it is claimed that, for open-hearth furnace work, they excel heavy steel scrap, especially from the viewpoint of time saving. It is better not to melt briquetts with heavy scrap and pig. The following report of the melting experiment made in Europe with briquetted steel shavings is of interest in this connection:

"The briquettes were made of shavings produced from turnings of steel tires and weighed from 8 to 10 kilograms per briquette. These were used as a substitute for heavy steel scrap. Test No. 1 containd 53 per cent briquettes, 16 per cent heavy scrap, and 31

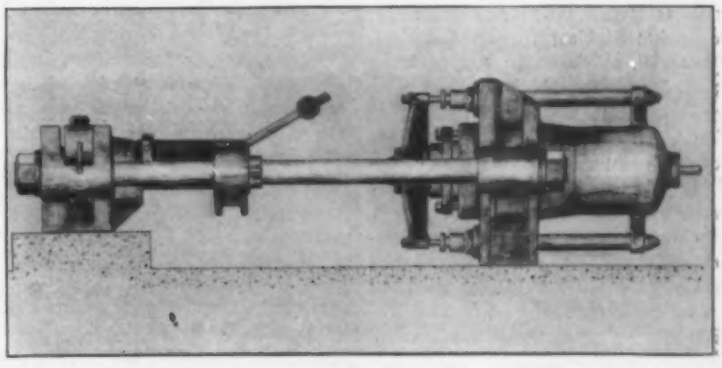


FIG. 7—GILMORE BRIQUETTING PRESS

per cent pig iron. Test No. 2 contained 17 per cent briquettes, 48 per cent heavy scrap and 35 per cent pig iron. The total weight of material used in both tests was 20.5 tons. The elapsed time from the beginning of charging until the liquid metal left the furnace, was in the first case 50 minutes and in the second case 30 minutes less than with similar charges when using metal shavings not briquetted. The melting time was in the first case 25 minutes and in the second case 15 minutes less than when steel shavings were used instead of briquettes. This proved economy of time provides an increased annual production of from 2000 to 3000 tons per furnace. The 15 tons of briquettes were placed in 12 receptacles as compared with 23 required by the same quantity of steel shavings. It was also proved that the handling of the briquettes as compared with the handling of the steel shavings, not only saved the 35 minutes time, but also the time of three laborers. The briquettes melt fast, shorten the melting time of the heat, pile nicely in the furnace and provide an even circulation of the gases. A series of experiments at a prominent steel works using electric furnaces recently brought forth the following report:

"The briquettes made of steel turnings were unloaded with a magnet crane, just as all other scrap is handled, with no breakage noticeable. The easy handling, as well as the advantage derived in melting down, make them an ideal material for electric furnaces. The briquette charge cleared the banks of the furnace easier than ordinary scrap, lessening, very considerably, the work of breaking up the compact mass along the bank. In fact, the briquettes fall with very little help and therefore melt in far shorter time than ordinary scrap."

Briquetting of By-Products

In the treatment of by-products a leading question to determine is the proper binder or catalytic agent. A catalytic agent in briquetting may be defined as a reagent which, possessing no cohesive property, causes the acquisition of cementing properties in the material treated. A very notable instance is that of blast furnace flue dust. This material, as shown in Fig. 6, for a long time has been subject to discussion and experiment to discover a method of reclaiming it. In America, various methods of sintering have made headway. In Europe the usual answer lies in briquetting, using a catalytic agent. The Schumacker process has been installed at the plant of the Wickwire Steel Co., Buffalo. A description of this plant will probably best show the working of the catalytic process as applied to blast furnace flue dust briquetting as now being practiced. From the stock pile the flue dust is carried by cars to a trestle over the platn as shown in Fig. 6, and dumped from the cars on a grizzly which catches any of the coarse material, available for blast furnace without the necessity of briquetting. The screenings are caught in the feeding bin and fed thence to the mixing table. Here the proper proportion of the catalytic agent is added—in this case a solution of copperas in the proportion of about one-half of 1 per cent. The material is turned, by a rotating feeding device, on to a mixing table into which the salt solution is simultaneously run. From the mixing tables the mixture is run through a horizontal paddle mixer and then to a tub mixer which acts as a press feed. The mixer is especially designed for safeguarding against breakage and undue stress.

This press is of the lever, power-actuated type, better known probably as the toggle press. Power is applied by means of a belt. One end of the double girder bed plate, by means of cross girders, serves as the lower platen. The upper platen is held by tie bolts and separators. One separator forms the journal about which the mold and plunger platen revolve. On the other separator is a brake to check the mold platen and prevent over travel. On the mold platen are 12 cylindrical steel molds, 7½ inches in diameter, each provided with a plunger fitting in a bored brass-bushed guide, held by spanner rings in a flange below the mold. The top of the platen and upper end of the plungers are provided with removable wearing plates. When the crank is nearly at 90 degrees beyond lower dead center, the pressing begins. The timing of the mold platen is such that the plungers come to rest over the press plunger while the crank is approaching the lower dead center with clearance between them. The press plunger is mounted on a strut with a hemispherical end. A die and punch with shear plate above the mold give relief against any excessive pressure. To provide for pressure variations in forming briquettes the fulcrum of the main lever is carried by an oil cylinder cushioned on a flask of nitrogen gas. A pressure of 8400 pounds per square inch is obtained on each briquette made. When this pressure is exceeded sufficiently to force the oil plunger to the bottom the shear plate safety device acts.

The mold is driven by an interrupted pinwheel, keyed to a vertical shaft. This wheel carries a single pin which engages the slots on the under side of the upper portion of the mold platen and the enlarged hub of the wheel engages a cylindrical recess machined in the platen between the pin slots. Thus the platen is locked for nearly half the revolution of its driving shaft. During the locked period the filling, pressing and discharge of briquettes occurs.

To discharge the briquettes a plunger is carried on a bracket bolted to the girder. A bell crank driven by a connecting rod attached to a crank pin in the bulb of one of the main driving gears, actuates the plunger. A compression spring device is provided on the connecting rod to hold the ejecting plunger momentarily while scraping off the briquette. The briquette, forced up by the plunger, is pushed off by a cross head to the space between the molds where they are carried off on a conveying belt.

The capacity of the press is 1200 briquettes, 7½ x 3½ inches, or approximately 7 tons per hour. The usual rate of production is 20 briquettes per minute, equivalent to a speed of 20 revolutions per minute of the main gears, or 175 revolutions per minute of the belt pulley. Skilled labor is not required in the operation.

The briquettes then are stored and allowed to cool after which they are ready for the furnace and are mixed with the raw ore, usually in a proportion somewhat less than 10 per cent of the charge.

The coke content in the briquette performs useful reduction work and contributes to a real saving in fuel in blast furnace operation. The briquettes have about 25 per cent porosity, permitting the furnace to work at low blast. The strength of the briquettes is such that they carry the burden easily without disintegrating. They stand the weather well and the cost of fabricating is well below 70 cents per ton.

Work Manganese Mine

Development work is being carried on at the High Head manganese ore property of the old Shenandoah Iron & Coal Co., which owned the Liberty blast furnace at Liberty Furnace, Va. A large deposit is said to be now under development. Test samples are said to indicate a manganese content of 52 to 57 per cent. The Liberty furnace has not been operated since 1906, but mining operations have been carried on. The property recently was taken over by Joseph T. Jackson, president of the J. T. Jackson Co., Philadelphia.

Build Furnaces Rapidly

A rapid record of open-hearth furnace installation has been established by the Interstate Iron & Steel Co., Chicago, which has just put in operation two 80-ton units on which construction was begun Jan. 13. In addition, complete gas producer, loading and handling equipment were installed.

A Systematic Method of Storing Patterns

Foundry Operation Aided by Well-Arranged Facilities With Comprehensive Record of Patterns

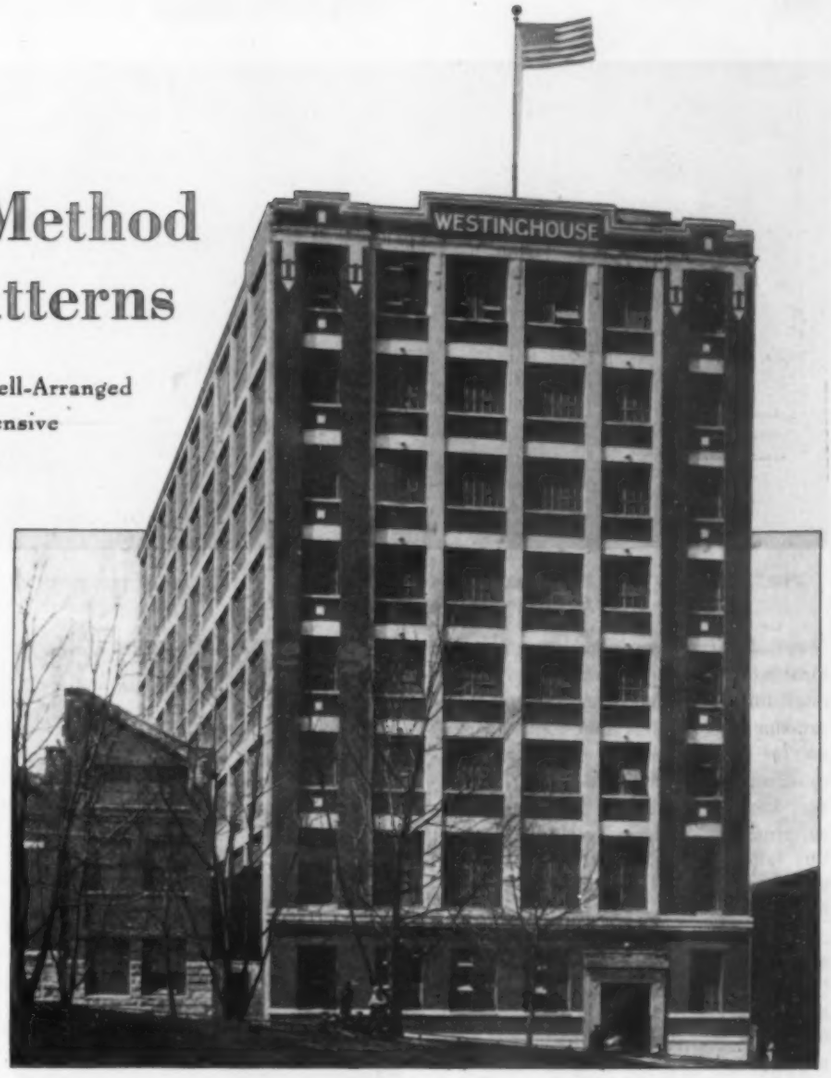


FIG. 2—A SPACIOUS BUILDING IS AN AID TO GOOD STORAGE

A TENSE air of expectancy dominated the dingy office of the International Castings Co. Chapman, the core room foreman; Ashland, the chief patternmaker; Elsey, the head draftsman; and O'Malley, boss of the molding floor, anxiously waited for the superintendent, Randall, to state the reason for his hurried summons.

After carefully extracting a few papers from the multi-colored assortment on his desk, Randall swept the faces of his audience with a critical eye and then plunged into the subject of the meeting.

"Something is radically wrong with our organization. We are losing altogether too much time hunting for patterns. Listen to this:"

Picking up a telegram from the Universal Engine Co., he read:

"Rush five hundred gray iron castings, our pattern three six two nine. Pattern sent January fifteen, nineteen sixteen, for previous order."

"Now although we made 100 of these castings only a few months ago, none of you gentlemen were able to locate the pattern. We looked high and low, and I venture to say that the time spent in trying to locate the missing pattern was worth at least $50 to this company. After waiting a day, I was obliged to wire the Universal people for a drawing so we could make another pattern. Listen to their reply."

"Cancel order, cannot wait for new pattern, letter following."

Randall picked up a letter from the desk and passed it to the foremen. They read:

International Castings Co.,
Pleasantville, O.
Gentlemen:

We regret that we were obliged to cancel our telegraphic order for 500 castings, our pattern No. 3629. The castings are required to complete a rush job for the government, and the delay which would have ensued if we had waited for you to make a new pattern would have made it impossible for us to fulfill our promise of early delivery.

Consequently we delivered a duplicate pattern to a local foundry which is in a position to fill our order immediately.

You will understand that our action is no reflection on the quality of the castings you have furnished us on past orders.

Very truly yours,
UNIVERSAL ENGINE CO.

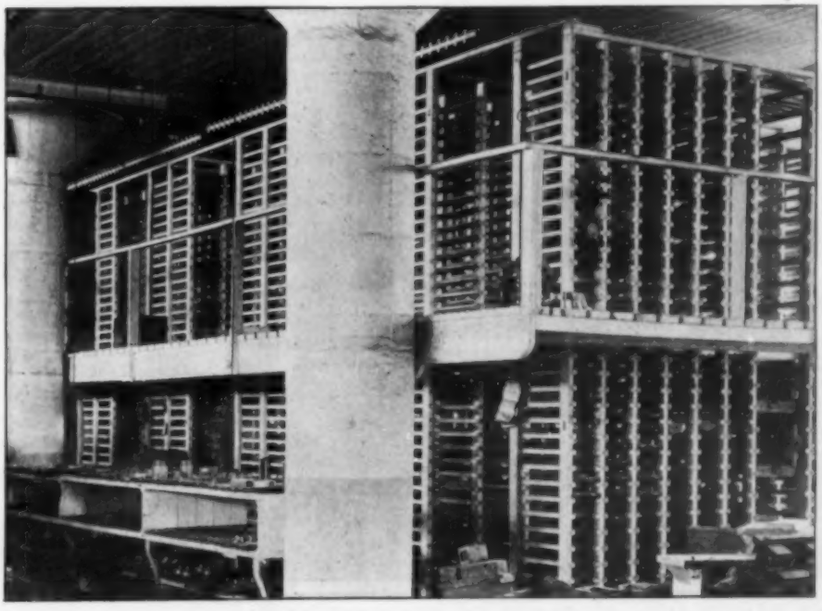


FIG. 1—MACHINE PATTERN PLATES ARE STORED ON NUMBERED SLIDES

"So you see, gentlemen," said Randall,

FIG. 3—EVERY PATTERN MADE IN THE PATTERN SHOP IS CARDED EVEN BEFORE WORK ON IT IS COMMENCED

"our lack of system in handling patterns lost us a mighty profitable job. All of our efforts to bring the quality of our catsings up to the present high standard go for naught in this case simply because our organization does not provide for keeping a reliable record of our patterns. What have you to say about this fall-down, Ashland? You're the man who is supposed to know where our patterns are kept."

"Well, I guess our system is a little weak", admitted the chief patternmaker. "You see we don't keep a record. We simply have a rack or bin for every pattern, and we chalk the number of the pattern on rack which holds it. If a pattern is missing, we take for granted it is in the foundry. We have had only a few cases where patterns have gone astray. The Universal Engine Co. pattern is the first one we have lost in a couple of months. I doubt if it would pay to keep a lot of records of our patterns."

FIG. 5—STENCILED NUMBERS ASSIST IN IDENTIFICATION

"Wait a minute," broke in Randall. "You say you think it wouldn't pay. Why man, the money we lost on that Universal Engine deal would pay for the maintenance of a complete file system for a year! We are going to start a record of patterns, and we are going to start it today."

"Ashland, have your clerk make out a card for every pattern we have. When you deliver a pattern to the foundry, you charge it off the card. Elsey, when you make the drawing for a new pattern, send a memorandum to Ashland so that he can make out a card for it. Then, Ashland, you are to write on each card the number of the core box or boxes required with each pattern, and then go over the matter with Chapman so that there will be some sort of a check on core boxes for the core room and pattern storage department. O'Malley, when you return patterns to the storage department, give Ashland a list of patterns so that he can check them off the cards. A week from today I shall expect you men to come here and tell me how the new system is working. That's all for today."

* * *

It is almost unnecessary to state that in the course of a few months Randall's plan developed into a smoothly running system of records which saved the company many times its cost in improved service to its customers. If the average foundryman would face the pattern storage problem with determination, and would employ the effective measures adopted by the International Castings Co., there would be less embarrassment in promptly producing castings. So many foundries have neglected to systematically handle patterns that the

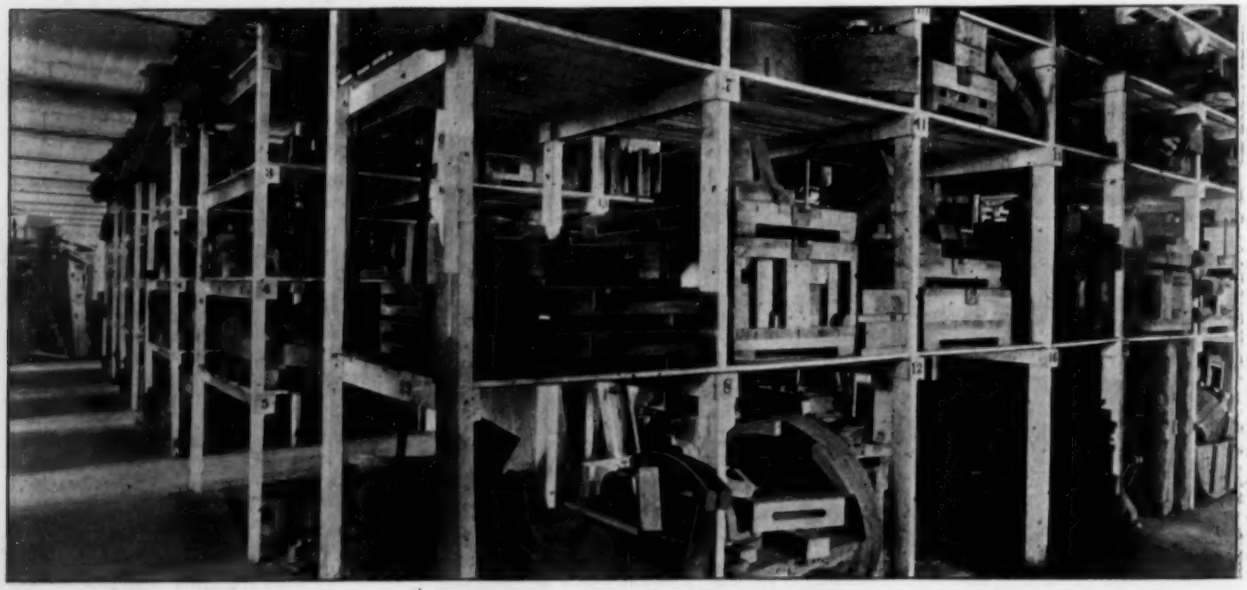


FIG. 4—PATTERNS OF MEDIUM SIZE ARE STORED ON NUMBERED RACKS

methods followed by a company which has successfully solved the problem should be of particular value.

The records maintained by the Cleveland foundry of the Westinghouse Electric & Mfg. Co. constitute a system which has proved highly successful in tracing the movement of patterns through the various departments of this extensive organization. The list of patterns, core boxes, pattern plates, and machine plates is so comprehensive and yet so simple that any one of over 50,000 pieces stored on seven floors of a large storage building may be found almost instantly by referring to the card file.

The present system is the development of a plan conceived when many of the castings used by the Westinghouse company were made at the old foundry at Allegheny, Pa., before the Cleveland plant was increased to its existing capacity. The original plan of numbering patterns provided for seven or eight series of 10,000 numbers, the numbers of each series having a letter prefix as *B, C, G,* etc. The numbers of each series were listed on 8 x 10-inch sheets bound in manila wrappers. Spaces were provided for marks to designate the location of the patterns in the storage racks, and for the dates on which the patterns were received from the pattern shop or sent to the foundry. When the Allegheny foundry was moved to Cleveland, the information on the sheets was transferred to a card file, the letter-prefix series being continued as before. Later another series with numbers running up to 50,000, and having no prefixed letter was started but before it was completed, the present scheme of numbering was adopted.

One of the disadvantages of the old systems, and the factor which prompted the change, was the existence of two complete and distinct sets of numbers for drawings and patterns. Under the old method of numbering, it was necessary to refer to a bulky volume of tracing numbers to determine the pattern shown on any particular blue print. If a pattern had to be replaced it was necessary to refer to a book to find out what blue print should be consulted. The inconvenience of this frequent procedure led to the adoption of the present series of pattern numbers.

The "six cylinder" series, as the new set of numbers is called, starts with 100,000. The pattern numbers correspond to the numbers of the drawings. For instance, if four patterns are shown on tracing No. 321,654, the patterns are numbered 321,654-A-1; 321,654-A-2; 321,654-A-3, and 321,654-A-4. When an alteration has been made in the tracing, the drawing number becomes 321,654-B,

FIG. 7—SMALL PATTERNS ARE KEPT IN DRAWERS—SOME OF THE DRAWERS HOLD AS MANY AS 50 PATTERNS

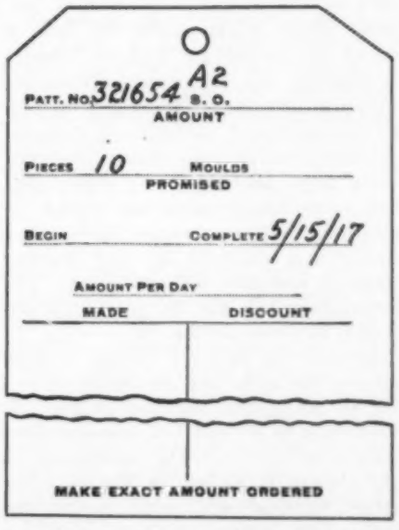


FIG. 8 — A TAG ACCOMPANIES EACH PATTERN TO THE FOUNDRY

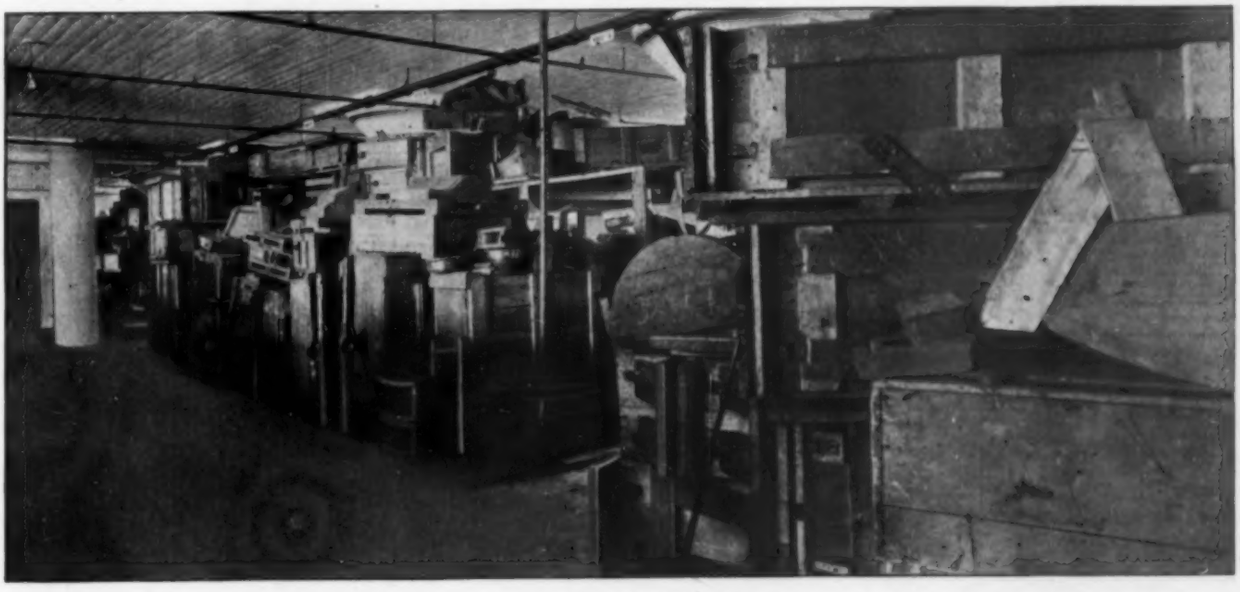


FIG. 6—LARGE PATTERNS AND CORE BOXES ARE GROUPED IN NUMBERED SECTIONS

	FLOOR	SECTION	RACK	SHELF
	3		12	2-3
PATT No. 321654-A-2	WOOD /		MACHINE	
CONJ.	METAL		PATT. PLATE	
	ORIG.		FLASKS	
			CORE BOXES /	
~~1-2-15~~				
~~3-6-15~~				
~~1-13-16~~				
~~2-27-16~~				
~~3-8-17~~				

FIG. 9—FACSIMILE OF A FILE CARD—THE INFORMATION ON A CARD INDICATES THE MOVEMENT OF THE PATTERN THROUGH THE VARIOUS DEPARTMENTS

and the patterns for the altered casting are 321,654-B-1; 321,654-B-2; etc.

The card index, which is the keystone of the system of records, is kept in cases in an office on the first floor of the pattern storage building and is conveniently near the point where patterns are delivered to and from the foundry. Each file case is plainly labeled with the lowest and highest number of the cards it contains. New cards are made out by the file clerk when he receives a memorandum from the engineering department at the East Pittsburgh office stating that certain drawings have been prepared. When the pattern shop receives authority to make a pattern, a notation to this effect is made in pencil on the card. When the pattern is completed and delivered to the storage department, it is accompanied by a memorandum, and the file clerk erases the pencil notation and marks the location of the pattern in the pattern storage department on the card in the space provided. This is shown in Fig. 9, which is a reproduction of the file card.

Patterns are stored on the first seven floors of the eight-story pattern building which was described in the April, 1916, issue of *The Foundry*. The small patterns which might easily be lost if stored on shelves are kept in drawers as shown in Fig. 7. Larger patterns are arranged on racks as illustrated in Fig. 4. Medium-sized patterns are kept on the second to seventh floors, while the extra large patterns, bulky core boxes and other heavy parts are stored on each of the seven storage floors. The stories are connected by two spacious elevators and two wide stairways. The arrangement of the floors is approximately as shown in Fig. 10.

In order to facilitate finding a given pattern, the racks are numbered according to the system indicated in Fig. 10. Each rack is divided into compartments known as shelves. The numbering of the shelves is shown in Fig. 4. The large patterns and core boxes are grouped in sections, and each section is marked by means of a painted sign suspended from the automatic sprinkler pipes near the ceiling as indicated in Fig. 6. Pattern plates for machine work are stored in racks on the first floor as illustrated in Fig. 1. Each slide in the racks is numbered by a painted metal tag. The file clerk is assisted in finding all of the pieces used with each pattern by notations on the card which show the number of cores, loose pieces, etc., required. An effort is made to store related patterns, coreboxes, and all other parts on one shelf or in adjacent shelves.

When more than one pattern is required to make a casting or when one of several patterns may be used to make a given casting, these facts are noted on the face of the card. This is an essential provision, for it is often possible to make one pattern take the place of another by simply using different cores. Each core box, and many of the patterns are stenciled with numbers to show the various pieces required to make up the entire pattern. This stenciling is shown in Fig. 5.

Referring again to the file card, Fig. 9, space is provided for showing the type of pattern used. After the words, "wood, metal, machine, pattern plate, flasks, core boxes" are spaces for inserting the number of each of these items. For instance, the card shown indicates that the pattern is of wood, that it is in one piece, and that one core box is used in making the casting.

When an order comes to the foundry for a casting, a triplicate copy of the order is sent to the file clerk. The order shows the number of the pattern, the number of castings to be made, and the date when the castings are to be completed. The clerk copies the pattern numbers into a book, and then by referring to his card file, marks the location of the patterns after each number in the book. Attendants then consult the book, go to the designated rack or section, and carry the pattern and necessary core boxes to a receiving point near the file clerk's office.

In the meantime, clerks in the main foundry office have made out tags similar to the one shown in Fig. 8. Each of these tags shows the pattern number, the number of castings to be made, and the date promised for completing

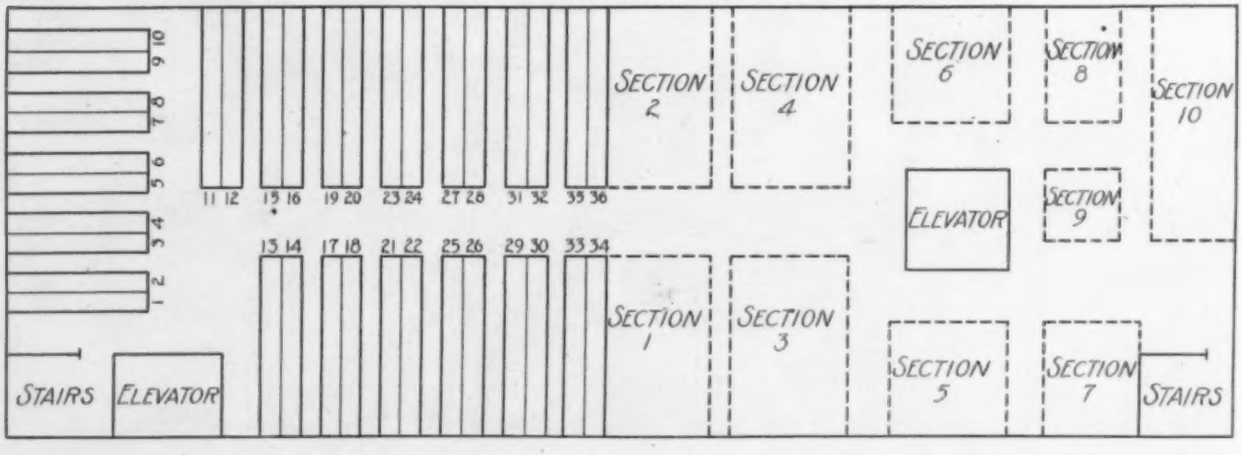


FIG. 10—ARRANGEMENT OF RACKS, SECTIONS AND ELEVATORS IN PATTERN STORAGE BUILDING

the castings. These tags are delivered to the file clerk, and as his assistants attach the tags to the patterns they have collected at the receiving point, the clerk writes the date in the space below the double line on the file card. The plain date indicates that the pattern was delivered to the foundry on the day indicated. When a pattern is sent to the pattern shop for repairs, a dotted line is drawn under the date. Thus the card shown in Fig. 9 indicates that the pattern was delivered to the foundry Jan. 2, 1915; March 6, 1915; Jan. 13, 1916; and March 8, 1917. It was sent to the pattern shop Feb. 27, 1916. If for any reason the pattern was shipped to the East Pittsburgh works, this fact and the date of shipment is noted. When a pattern is scrapped the word "scrapped" with the date of scrapping, is stamped on the face of the card, and the card is retained in the file to show the disposition of the pattern.

After the pattern has been used in the foundry, it is returned to the receiving point, and is accompanied by a memorandum from the foundry foreman. On receipt of the pattern, the file clerk refers to the card to find out the numbers of the core boxes and other pieces which belong with the pattern. His assistant then goes to the core room and collects the core box, and when all of the parts of the pattern have been collected, they are stored in the proper place in the storage rooms. The file clerk then draws a line through the date on the file card, thus indicating that the pattern has been returned and is again in its proper place on a certain floor of the storage building.

Tungsten's Meteoric Rise and Fall

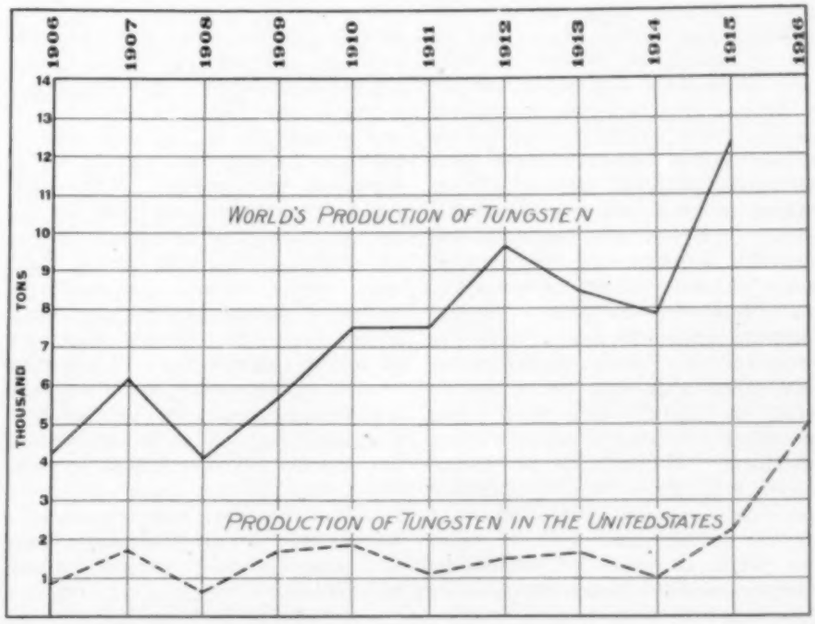
WAR has written more romance into industry during a brief period of a little more than three years than a prolific perpetrator of best-sellers can cram into the sum total of his life work. Truth is stranger than fiction and a lot more interesting; popular magazines prove this by the space they devote to fanciful descriptions of the many war-born industries. Sensational ups-and-downs of the stock markets have proved enticing subjects appealing to editors of widely circulated periodicals. The mystifying art of the chemist and the metallurgist proves as interesting to the public today as did the wonderful tales of Sherlock Holmes a few years ago when pacificists were held to be sane and war was not the ultimate consumer of man's energies and the world's products. However, war is all important now and it is of little wonder that popular curiosity is arroused by the far-reaching developments it has stimulated in industrial circles. The impelling factor in almost every case arises from the demand for increased production or from the desire to supply a formerly imported commodity. This factor, in both phases, has had a marvelous effect on the production of tungsten in the United States. The high prices obtaining for tungsten and its ores have stirred up activity among tungsten prospectors and promoters that rivals the excitement following the discovery of gold in '49.

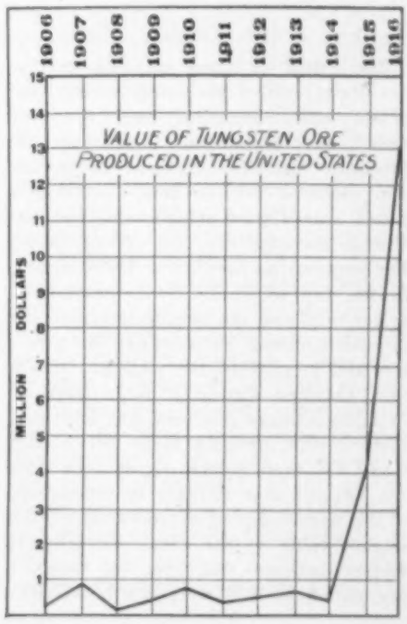
Occurrence of Ores

Tungsten bearing ores occur in general regions of granite rocks, though, in some cases, the ores are found where granular rocks do not appear at the surface intimately associated with the vein. The tungsten minerals, like tin ore, usually are deposited in veins about ¼ inch in diameter. Occasionally veins are found which are as large as a man's arm and, in rare instances, as large as a man's body. At the intersection of two veins, pockets occur that contain a large quantity of rich ore. In some cases these pockets may hold as much as two cubic yards of ore. Very infrequently, the ore deposits break through to the surface where they are easily accessible. A very interesting description of the mining of tungsten ores in Colorado by Roy C. McKenna, president of the Vanadium-Alloys Steel Co., Pittsburgh, appeared in the Dec. 30, 1915, issue of THE IRON TRADE REVIEW.

Arizona, California, Colorado, Idaho, New Mexico, South Dakota, Washington and Alaska furnish most of the tungsten ore mined in the United States. The oldest tungsten mines are found in Spain and Portugal. The Burma and Shan fields in the Federated Malay States have furnished many tons of ore in recent years. Several other countries produce small quantities of tungsten ore.

The abnormal demand for high-speed steel to cut war material ordered by the governments of Europe was responsible for a great increase in the production of tungsten ores in this country. It is stated upon good authority that the





quantity of high-speed steel used by the metal industries increased five-fold with the placing of foreign orders in this country. At first, the tungsten miners in this country failed to bear up under the suddenly increased pressure. England, realizing the necessity for tungsten in the production of tool steels, placed an embargo on ore from the Federated Malay states which served to further aggravate the tungsten market in the United States since these fields had previously been the chief source of supply.

Industry at Low Ebb

During the lull that prevailed before the storm of munition orders, which broke loose upon the United States some four or five months after the initial declaration of hostilities abroad, the market remained at the low levels that had been maintained for some time previous. Prices at that time were low; $6.50 a unit being practically standard. A unit is 1 per cent of tungsten trioxide. After the momentary paralysis of the industry caused by the disturbed industrial and commercial equilibrium, higher prices were quoted. When manufacturers realized the golden possibilities of war orders, buying of tungstic acid began in a spasmotic fashion which caused prices to be irregular. Purchasing was influenced by the fear of buyers of the possibilities of not being able to fill their requirements when the need for tungsten would be even more stringent than it was when the prospects of huge profits in shellmaking first appeared on the clouded horizon. Before the end of 1914, ores carrying 60 per cent of tungstic, triozide, WO_3, brought as high as $9.00 or more a unit. The demand however, was not stable, and instances are recorded where sales were made early in 1915 for as low as $5.80 a unit.

War Orders Stimulate Mining

The effect of these unstable market conditions and of the comparatively low prices which prevailed until the war orders were placed was to preclude the profitable operation of many properties. The demand became more acute and prices soared from a minimum, after the British embargo went into effect during the summer, to $40.00 and $50.00 a unit in the fall of 1915. Such inflation of prices proffered the needed incentive for increased mining operations in this country, and in spite of the stagnant market that obtained during a large part of 1915, the tonnage produced was 2.35 times that of 1914, jumping from 990 to 2332 tons. Of even greater significance than the 136 per cent increase in production, is the unprecedented skyrocketing of the market value of the ores. Government figures indicate that the 990 tons of ore mined in 1914 were worth $435,000. A year later this figure had to be multiplied by 10 to give a fair estimate of the value of United States tungsten ores. The actual value was $4,100,000. The average value per unit in 1914 was $4.38; a year later this figure had increased 302 per cent to $17.60.

The tungsten production of the United States during the first six months of 1916 exceeded the production of this or any other country in any previous 12 months according to a report of the United States geological survey. Frank L. Hess of the survey estimates that the output for this period was 3290 tons of concentrates valued at $9,113,000, an average value of $27.70 per ton. Estimating the year's production at twice 3290 tons, the increase over 1915 is about 182 per cent. Average figures, however, do not serve to convey a true impression of the turbulence of the tungsten market at the beginning of 1916, for ores carrying 60 per cent of tungsten trioxide sold at that time for $66. In the latter part of March, sales were made at $93.50 a unit and several cases have been reported of transactions at over $100. The grossly increased prices culminated in such a development of domestic deposits that production overran the demand and by the last of June, prices had receded to a $25 level. The accompanying charts serve to indicate the increase in consumption of tungsten, the greatly developed capacity of the country for producing tungsten ores and the enormously increased value of ores produced in the United States.

Huge Tonnage of Steel Made

The imports of tungsten ores, chiefly from South America, Japan and Mexico, for the first half of 1916 amounted to 1824 tons. If to the American production, imports are added, the consumption seems to have amounted, roughly, to 5100 tons of 60-per cent concentrates, valued at $13,278,000. On the supposition that 20 per cent of the metal was lost in various operations, it seems probable that between 11,000 and 12,000 tons of new high-speed steels were made during the period, in addition to the steel made from tungsten saved from scrap and scale.

Safeguarding Costly Tools

DUE to the speeding up program which has prevailed during the last year, automatic machinery as well as automtaic control has rapidly forged to the front. Automatic starters and controls for motor-driven tools has occupied the attention of the engineers of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and their efforts have been along lines tending to diminish manual labor where possible and to guard against improper starting of high-speed and heavy-duty machines by unskilled operators. When starting motors connected to line shafting upon which there is a heavy load, or in starting and stopping heavy-duty machine tools, conditions encountered in this class of service require from 100 to 200 per cent full load torque, making automatic starting a desirable feature. Likewise it is important that protection be afforded to the operator, motor and tool, should the power on any circuit fail suddenly. Serious accidents sometimes result when the power suddenly comes on after having been temporarily shut off, often injuring the operator as well as doing considerable damage to expensive shop equipment. Motors protected against a return of power are disconnected from the line when power fails and are not started again until the operator presses a button or manipulates a similar device. Unexpected starting of the machine is impossible where automatic control is installed. The operation of the automatic starters is simple and the vital element is the magnetic contactors which are opened by spring action assisted by gravity. The destructive action of the arc is reduced by blowing-out coils and arcing horns.

New Switch Reduces Labor

In order to reduce the effort necessary to operate large lever switches used in starting synchronous converters in conjunction with auto transformers, the General Electric Co., Schenectady, N. Y., has developed an ingenious arrangement consisting of two triple pole lever switches. When starting a synchronous converter, the upper contacts are connected to the two-thirds voltage tap for a short time and the contacts are constructed to make contact with the portion of the blades first thrown downward or to the running side. This portion of the switch, which comprises half a blade area, carries the currents until the remaining half of the switch can be thrown to the lower position. Equipment of this type has been built up to 5000 amperes capacity and its use eliminates the installation of large solenoid-operated circuit breakers.

BRITISH CONTROL OF IRON AND STEEL IN WAR

Typical Yard Scene in a Modern English Blast Furnace Plant

ONE of the astonishing results of the war has been the industrial revolution effected in Great Britain. Before the war it may be doubted whether there was another civilized country in which manufacture and industry generally was left so completely to its own devices as Great Britain "Laissez faire" was the motto. Business was left entirely to private enterprise, manufacturers were allowed to sink or swim, to produce or not to produce at their own sweet will and to pay what they liked for labor subject of course to what the trade unions had to say on these subjects. As to their markets in the words of Milton "The world was all before them where to choose and Providence their guide". All this has changed. Industrialism has entered into the very fibre of English government and hardly anybody can say now that his business is really his own. It may be doubted whether even in Germany the absolute knowledge and control of industry in all its ramifications and its detailed operations exceeds that in Great Britain. The country is out to make the most of itself in business and in self-development, as completely as in war. Old-time conservatives almost violent in their individualism before the war ask themselves with a kind of ironic smile how they have come to let the control of their own industries slip so completely out of their hands; and there is no end of speculation as to how much of this self-effacement will remain in force after the war. The iron and steel industry as the general provider of war material, the principal handmaid of Mars, one might call it, naturally holds the central position in the Ministry of Munitions and probably its activities of all sections, are the most far-reaching and important. A few details of its achievements were lately given by Dr. Addison the Minister of Munitions in his recent statement to parliament. The output of steel for years was more or less stationary, at about 7,000,000 tons per annum. It is now 10,000,000 tons, and he looks for a total of 12,000,000 tons by the end of next year. The increased production of basic steel from home ores is intended to add by spring of 1918, an additional 1,750,000 tons of basic steel. Within 14 months from the commencement of the scheme it is intended to increase the home capacity for the manufacture of such steel by 30 per cent. The home production of spelter or commercial zinc formerly only one-third of the national requirements is expected to be doubled by the end of the present year. In addition a special department has been formed to develop the home resources, first in iron ore, and later in nonferrous ores. It is intended to enormously increase the home supply of tungsten, to reopen lead mines, to obtain as much zinc as possible, and perhaps to get a certain amount of copper from British sources.

Great pressure is being exercised to increase the output of steel, by the enlargement of existing furnaces or by the erection of new ones. In Cleveland especially, strong efforts are being made to increase the number of furnaces in blast. It is hoped that six more blast furnaces will be in operation by the end of the present year. Strangely enough, the principal obstacle to progress has come from another department of the government, namely the war office, which has resisted as strongly as possible the restoration from the war area of those skilled workers whom no national service scheme even added by the genius of Neville Chamberlain can replace.

It is self-evident that the great suc-

Study British System

KEEN interest in the methods by which the British government has exercised control over its iron and steel industry in war time has been aroused among producers and consumers in this country by the various proposals that have been made at Washington looking toward the regulation of prices and distribution. J. Horton, associate editor of THE IRON TRADE REVIEW at Birmingham, England, describes in this article how the system in Great Britain has been organized and tells what the practical results of its operations have been.

cess undoubtedly realized would not have been possible but for the co-operation of the steel trade itself. Manchester iron and steel men are rather proud of the fact that John Hall, the director of steel control, is from their district and before the war was an active partner in a well-known firm of Manchester and Birmingham merchants. The trade has complete confidence in his knowledge and judgment. But the industry as a body has practically placed itself at the service of the government. There is hardly a leading steel manufacturer expert or chemist in the country who has not held himself unreservedly at the disposal of the ministry for consultation. In most cases the service has been rendered gratuitously. Men whose names are household words in the steel industry of the world have given the ministry the full benefit of their knowledge and judgment in all sorts of emergencies and often with complete disregard of self interest. Undoubtedly the success of the ministry has been largely due to the frankness with which all parties concerned have been consulted before any important changes have taken place. This can best be illustrated by the procedure in connection with the fixing of prices, as, for example, of pig iron or finished iron and steel. The director of steel production has one or two branch departments handling different sections of the trade and in addition the finance department which deals with all questions of costs, balance sheets and accounts generally. When any alteration in maximum prices is desired, application has to be made through the director of steel production. Usually a committee of the manufacturers is named for a conference with the committee of the steel production department which, it may be explained, also embraces all iron production. The matter is then generally discussed and the ground upon which the claim is based for an advance is considered. Usually before any increase in the maximum price is agreed upon, actual facts and figures have to be submitted to the finance department to justify the claim. The department has to be satisfied that the demand is a reasonable one, and they themselves reserve the right, before consenting to any such advances, to make a proper examination of the books by the qualified accountants on the staff. The only real hitch that has ever taken place in the working of the iron and steel department occurred through the obstinacy of a certain Derbyshire smelter, who objected to having his books examined. The result was to hold up for several weeks the concession of an advance, which was very keenly desired by the pig iron people. The conservative obstructionist had a very bad time with his confreres, but eventually he gave way, and the business then went through smoothly. We have progressed so rapidly that nobody now thinks of putting a straw in the way of full investigation by the accountants of the government.

A very important department which does not always work smoothly is the priority department, to which all orders given out for machinery of every description, including electrical apparatus, have to be presented and duly passed and a certificate obtained before the order can be put in the hands of the manufacturer. The order of priority is indicated by the letter P. P 1 represents admiralty orders which for some time have had decided precedence; Nos. 2, 3 and 4 are war office orders and 5 nonwar and outside orders. No. 5, it may be remarked, gets very little opportunity to obtain satisfaction in these strenuous war times. With regard to price regulation, there is a sort of heart-to-heart frankness and the plainest in speaking always characterizes the conferences when manufacturers meet the committee for discussion of any claim put forward.

Maximum British Prices Today

PIG IRON
(Maker's Plant)

Hematite, East Coast, Scotch, Welsh	(122s. 6d)	$29.40
Hematite, East Coast	(127s. 6d)	30.60
Cleveland, No. 1	(96s. 6d)	23.16
Cleveland, other grades	(92s. 6d)	22.20
Staffordshire, common	(100s.)	24.00

ROLLED STEEL (Maker's Plant)

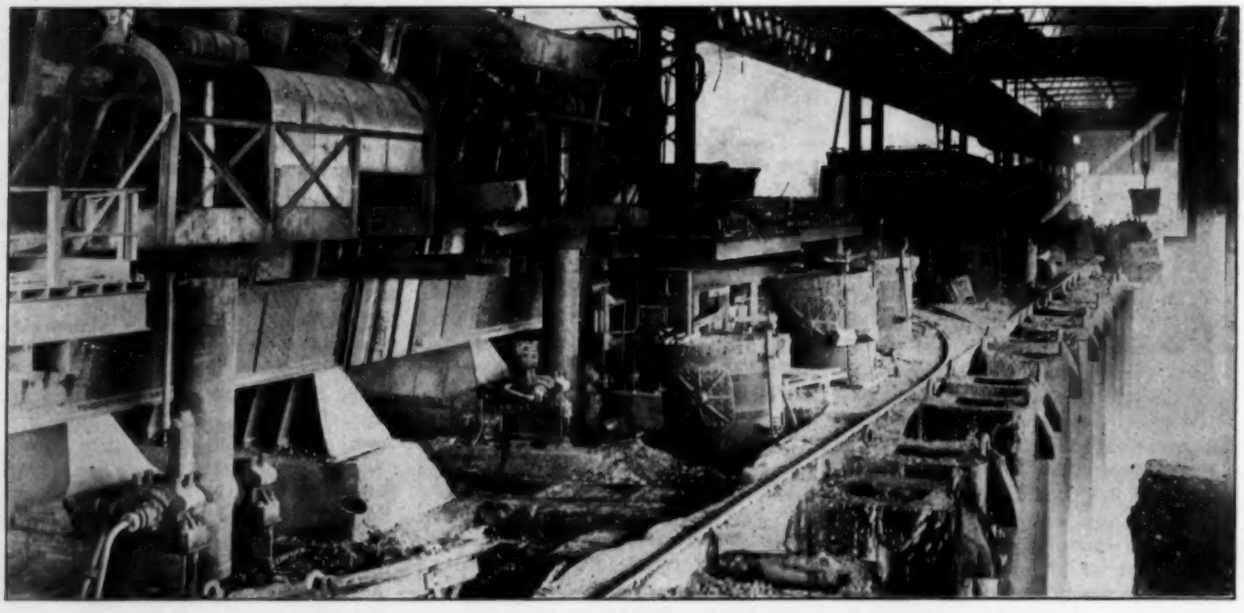
Ship plates	(274s.)	$65.76
Boiler plates	(298s.)	71.52
Angles	(266s. 6d)	63.96
Beams	(266s. 6d)	63.96
Standard rails	(257s. 6d)	61.80
Sheet and tin bars	(247s. 6d)	59.40
Blooms and billets, ordinary	(247s. 6d)	59.40
Blooms and billets, special	(264s.)	63.36
Merchant bars	(298s.)	71.52
Standard bar iron	(327s.)	78.48
Marked bar iron	(360s. Less 2½)	64.24

HIGH SPEED TOOL STEEL
(Delivered)

14 Per cent Tungsten per lb	34d	.68
18 Per cent Tungsten per lb	46d	.92

SCRAP (Delivered)

Heavy melting steel, t	125s	$30.00
Borings and turnings	58s	13.92



VIEW IN THE STEEL WORKS OF THE CARGO FLEET IRON CO., LTD., MIDDLESBORO, ENG., SHOWING TALBOT TILTING FURNACE

Probably the most important order issued by the director of steel control was that sent out from Whitehall Place, London, Nov. 20, 1916, which superseded others issued in August and at other dates. The order provided that no contract for steel made by the open-hearth or bessemer process, other than shell discard quality, should be accepted for manufacture, unless the purpose for which the steel was required had been approved and the requisite authority indicated by permits or contract reference from one of the government departments. The trade also was required to make full and accurate returns weekly of all steel manufactured and delivered. With regard to priority, steel for guns, mortars, gun carriages and parts thereof, come in the first class, known as Priority 1, and orders for shell steel or for other purposes are not permitted to delay the execution of these orders. Steel for shell parts, shells, bombs and grenades comes next. No steel other than shell discard quality is allowed to be manufactured for any order below Class B or that relating to what may be called indirect war orders or material having a more or less indirect relation to the war. The general effect of the sweeping order of Nov. 20 was to shut off from peace purposes practically all the steel made in the kingdom, subject, however, to a special permit which might be given by the director of steel production at his discretion with regard to any specification. As to shell discard steel, the only requirement was that the purpose for which the steel was used must be duly recorded in the return form furnished for the purpose.

Merchant Supplies Regulated

Substantially the same regulations apply to merchants who, before they place orders, must pass on to the works the government contract reference and number and purpose or the Ministry of Munitions permit reference and number, priority classification and purpose. These rules apply equally to holders of stock who cannot replenish their orders without permission from the government to whom they must furnish particulars of their normal stock of steel, the stock of steel desired to be held, and the average call on the stock of steel per month. Generally the effect of subsequent orders has been to extend these regulations to other manufactures and materials, and there are special regulations dealing with tin plates, terne plates, spelter, zinc, etc.

The director of steel control secures his knowledge of steel and other transactions very largely through the circulation of a large tabular form which has to be filled up weekly, or monthly, as the case may be. The object of this is to let the department know exactly the nature of the business transacted, the amount and character of stocks, etc. A typical form which he fills in weekly was shown to me by a Birmingham merchant. In this case, spelter was concerned, but where the object is to deal with tin plates, bars or other materials, the only change made is the indication in the left-hand corner of the material dealt with, and such modifications as is needed in other columns. At the left-hand side of the sheets are vertical numbers for detailed entries. Then there are parallel columns showing sales, stocks, quality, brand, guaranteed proportion of net zinc, etc. There are places to enter names and address of buyers, and there is also a column showing the amount left in stock. The procedure is very similar with tin plates, part of which are subject to strict control, while certain descriptions may be sold with considerable freedom, for the reason that these do not happen to be so urgently wanted now for war purposes.

Consumers also in the case of spelter have to fill out a somewhat similar form recording the total amount received, the amount left in stock, the amount used during a particular month and the estimated quantity called for during the following month. It is important that the use is stated to which it is put, as for example, in the case of spelter whether for galvanizing, for cartridge metal, brass, etc. All this involves a great amount of work. It is one of the standing grievances among manufacturers and merchants that while the department continually asks for more and more information, thereby adding to their labors, there is no diminution in the zeal with which the recruiting authorities continually draw upon the staff of the various establishments for the constant and enormous demands of the army.

On the whole, it can be said that the system works well and, in view of the considerable demands upon the patience of all concerned, with the minimum of irritation and friction.

Treatment of Tool Steel

TO ASSIST in attaining the desired uniformity during the series of tests conducted by the committee on tool research, it was decided that, at the outset, only one grade of tool steel would be used. The tools selected had a nose radius of ½ inch, a cutting angle of 70 degrees in a plane at 45 degrees to the length of the tool (this is equivalent to a front and side top rake of 14½ degrees), and a clearance angle of 6 degrees. The tools were 1¼ inches square in section, while the cut and traverse were to be 3/16 inch and 1/16 inch, respectively, and the cutting speed to be such as would give 20 minutes' life to the tool when heat-treated according to the steelmaker's instructions. The heat treatment recommended by the maker was to raise the temperature slowly to about 800 degrees Cent. and then quickly to 1275 degrees Cent. From observations made at the steel works it was found that, starting from a cold state, a 1¼-inch square tool took about seven minutes for the first stage and two minutes for the second stage of the treatment. The latter time was deemed sufficient to allow the heat to penetrate to the center of the nose and to fuse the extreme cutting edge. As these tools were heated in the smith's fire, actual observations of the temperatures could not be made.

A two-stage high-speed gas-fired furnace was used for heat-treating the tools.

How the Tools Were Prepared

Four tools (Nos. 1, 2, 4 and 5) were forged and ground to approved shape and were heated for 7½ minutes in the low-temperature chamber at 820 degrees Cent. They were immediately transferred to the high-temperature chamber at 1275 degrees Cent., where they remained for about 1¾ minutes (just long enough to produce a bright glowing strip about 1/16 inch broad along the cutting edge) and afterwards quenched in a molten metallic salt bath at 250 degrees Cent. The temperatures of the furnace chambers were observd by means of a Féry radiation pyrometer and that of the salt bath by means of an armored mercury thermometer.

For the cutting tests the trials were made on a medium steel bar without a lubricant. In all cases the test was continued until the tool failed, the nominal depth of cut being 3/16 inch deep by 1/16 inch traverse. The results showed a slight improvement on rehardening tool No. 1, and an improvement in one case, but not in another for tool No. 5. Tools Nos. 2 and 4 showed a decided deterioration on regrinding only after failure. This

This paper was presented at a recent meeting of the Manchester (England) Association of Engineers.

result was contrary to expectations, it being generally understood that the performance of a tool improves after the first failure.

An idea is held that high-speed steel is injured by repeated heating to a high temperature such as that required for hardening, and for this reason some engineers prefer to harden turning and similar tools in the smith's hearth, where the heat is concentrated at the nose of the tool. The results of these trials showed that two re-heatings do not appreciably impair the cutting quality of the steel.

It was then decided that tools Nos. 2 and 4 should be normalized, reground, hardened and tested again to see if the results first obtained by these tools could be equalled or perhaps improved upon. The normalizing process here referred to consisted in heating the tool slowly (taking about 10 minutes) to a dull cherry red (800 degrees Cent.), placing the tool in hot cinders and allowing it to cool. The normalizing preceded the grinding and hardening processes. In both cases the speed, cut and other conditions were to be the same as prevailed in the first trials with these tools. In neither case did the results equal those obtained by these tools when new, and when the performances of tools which had been simply reground and rehardened after failure were compared with tools which had undergone these processes, in addition to being normalized, it could not be found that any benefit had accrued from normalizing.

Effects of Normalizing

It was concluded that in the case of formed cutters which have been unequally strained in machining or in annealing, the normalizing process might tend to eliminate these strains, or perhaps reduce the risk of surface cracks, but it did not seem feasible that this process would have any pronounced effect on a lathe tool which has not been cracked, and which has been carefully forged and not hammered after the temperature has fallen below a cherry red, that is, about 900 degrees Cent.

The following conclusions were drawn from tests made up to this time:

That with freshly forged tools, hardened as stated and tested under identical conditions, it was possible to obtain results within 5 per cent of the mean or within an extreme difference of 9 per cent.

That the cutting capacity of a tool which has been tested as stated was not appreciably impaired by being rehardened, as often as three times, but care must be taken that the whole of the previously injured part is removed in the grinding before hardening. In rehardening a hardened tool the time taken for the cutting edge to reach the glowing stage appeared to be slightly greater than that for a soft tool.

That with such tools, treated as stated, normalizing did not appear to have any appreciable effect on the cutting capacity.

That the subsequent performance of a tool which had been simply reground (after being hardened and failed, as stated) was not equal to the original.

Further Tests of Value

Taking regard of the fact that better results are often obtained with a tool which has been simply reground after failure than was obtained in the first instance, and that in no case did this occur in these trials, it was decided to obtain the opinion of several steel experts with respect to this phenomenon. One authority who does much testing for the different steelmakers, could find no fault with the method of heat treating and testing, or suggest any alteration. He produced the results of a large number of tests of tools, all of which gave better results on being reground after failure. A second expert said he obtained the best results from tools heated in an ordinary smith's hearth, and the best final temperature was, in his opinion, between 1300 and 1350 degrees Cent. A third authority could find no fault with the procedure or explain why the tool on being reground should give better results than in the first trial. He was of opinion that if results were obtained within 10 per cent of each other the experimenters would do exceedingly well, even with tools made from the same ingot. The manner in which the ingot was cast, heated and drawn out, also the subsequent annealing process precluded the possibility of consistent uniformity in the cutting capabilities of the tools. Subsequently, he communicated the following:

It is inadvisable to anneal an ordinary lathe tool after forging and rough grinding. So far as the quality of the tool is concerned, and apart from any possibility of an increased number of wasters, it is preferable to have an ordinary lathe tool made from an unannealed bar.

The pre-heating temperature should be just short of the calescence change point, which in ordinary high-speed steel is rather below 850 degrees Cent. At such a temperature the time of heating is of no importance except in so far as the surface of the tool may become decarburized. If the preheating temperature is above the calescence change point, then in addition to decarburization it is possible also for the crystalline structure to grow larger; but an excess temperature of 20 or 30 degrees Cent. appears to make no observable difference.

After the preheating operation the temperature of the tool should be brought quickly to the final hardening temperature, say 1250 degrees Cent. The reason the heating must be done quickly is because at these high temperatures the crystalline structure grows coarser at a very quick rate, and in five minutes or less many kinds of tools would be entirely spoiled.

Certain kinds of high-speed steel air-harden intensively, and tools of moderate dimensions, or toothed tools made from such steels, had better be air-hardened. But there are other steels which require oil-hardening in order to get anything like the best results. There are also steels which if oil-quenched are soft, but if air-cooled are much harder.

The results of these experiments seem to indicate that normalizing shows no advantage for turning and that a tool which has been only raised to the hardening temperature at the cutting edge will deteriorate on regrinding while one that has been overheated at the cutting edge will improve on regrinding. It is also believed that the methods of hardening adopted by experts show great variation both as to the furnace temperature and to the duration of treatment.

Investigate Electric Melting of Brass

Representatives of the bureau of mines and of Cornell university have nearly completed an exhaustive investigation and study of the electric melting of brass.

The furnaces now used in the brass industry are said to cause a large loss of metal by volatilization, and require crucibles which have become very costly since the outbreak of the war. Long series of experiments have indicated that the use of a suitable electric furnace might materially reduce the metal losses and avoid the use of crucibles. The bureau of mines is now testing an electric furnace built on the design worked out in the laboratory tests. This furnace is of commercial size and is being tested with special attention to its suitability for use on such brasses as are used for cartridges and shrapnel.

Another electric furnace problem studied by the bureau has been the production of ferrouranium from the uranium oxide obtained as a by-product in the extraction of radium from its ores. Uranium steel, made from ferrouranium, is being used by Germany for making the liners of big guns, owing to its being able to with stand the enormous strains subjected by the rapid fire better than any other steel.

British Pay High for American Rods

Deliveries Just Made Command From $134.40 to $139.40 Per Ton and Almost Six Times Over Pre-War Days—Quarterly Meetings Lose Their Importance as Little Metal is Left to Open Bids

Bureau of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., July 13.

ONE of the remarkable effects of the war has been to deprive the quarterly meeting of the commanding influence it exercised in peace times. Certain export merchants, with large contracts to place, were always expected here, while a special train from South Wales brought in large numbers of tinplate makers. The special train has, of course, now disappeared, nor do export merchants pay any attention to the quarterly meeting. It is useless offering business to establishments fully committed for many months forward, and turning down every day more business than they can accept. Some of the offers received this week would have been sufficient to cover production over a good portion of next year. But they could not be entertained.

The meeting was entirely without influence upon prices. The makers of finished material have given up any idea, under present circumstances, of applying to the ministry of munitions for advances. It is said that mild steel wire has been put up £5 ($24.00) per ton, but this is immaterial since hardly anybody can buy any. Birmingham wiremakers say that any maker with wire to offer can get his own price, buyers being quite indifferent to price quotations. The question of wire rod supplies naturally causes concern. But some relief has come from America, whence several ship consignments recently have reached their destination on this side. A big price has had to be paid, such rods commanding from £28 ($134.40) to £29 ($139.20) per ton as compared with about £6, ($28.80) the price paid for German wire rods. The makers of tinned sheets here reaffirmed existing prices.

Little Steel For Non-War Use

The government continues to place orders very plentifully for all kinds of war iron and steel. During the past three months the authorities have increased their hold upon production. Very little metal now escapes for any purpose not connected with the war. Rather more discard British steel is available, but there is a continuous shortage of sheet bars, which has much to do with restricted trade done in sheets. The sales of galvanized sheets have now become quite negligible. Many tinplate mills are working very irregularly, through the shortage of tin bars. There is an increasing tendency to use painted sheets instead of galvanized sheets and the extra charge for painting has lately been increased from £1 ($4.80) to 25d ($6.00) per ton.

One of the results of the war will be an immense increase in shipbuilding capacity. During the past three years every yard of any importance has been extended, and it is predicted that the capacity will be quite sufficient to enable British shipowners very speedily after the war to make good their tonnage losses. In addition to this expansion of old yards, several new concerns have begun operations, or are preparing to do so, at different coast points.

The quarterly meeting is the usual period for the renewal of pig iron contracts and much of this business was done at the Birmingham meeting yesterday. But a good deal of discrimination was exercised by sellers, who would not, under any circumstances, entertain business from new customers. Nor would they take on bookings for more than three months supplies, although efforts were made in some quarters not only to get big orders, but to force down rates. One large buyer tried his best to get 1d (24c) per ton off Northampton iron, usually the weakest material in the market, but he failed completely, and eventually placed his 1000 tons at the full maximum government price. The principal bookings were for foundry material for military and naval purposes, but there was a good demand for forge iron. This material has tightened up a good deal lately, owing to the large number of furnaces that have taken up the manufacture of basic pig under urgent pressure from the government. Makers of finished iron now are starting an agitation to prevent any more such transfers, on the ground that forge iron is becoming really scarce, and that it is time to call a halt, if Black Country forges and mills, which are all making war material, are to continue in operation. Generally, smelters have their full output booked to the end of the year. In the Cleveland district, the tone is steady, production coming much nearer requirements than has been the case for some time. The demand by the allies for iron made in that district, easily absorbs the tonnage. If restrictions on export were relaxed, France and Italy would be glad to take larger quantities. Warrant stock shows a decrease of 221 tons. The selling price for No. 3 is 92d 6s ($22.20) to home consumers, and 102d 6s ($24.60) to the allies.

The fuel question causes increasing concern. The coal controller has lately been devoting his attention to the waste of time and labor in the transportation of coal over wide areas, and sometimes into other coal districts. Under the new system the country is divided up into 20 areas, each of which is numbered and defined. Coal may be sold within each area as before, but a special certificate will be needed, before it can be sent out of the area. Some allowance will be made for the transport of special coal, such as gas-making fuel, but it is hoped that the transport of 700,000,000 tons annually by public railways will be saved.

Need American Aircraft

The latest German air raid upon London will have a special significance for America, whose gigantic aviation program is especially welcomed here, in view of the frank confession that our present supply of machines is insufficient for war on the Continent, and in other fields, as well as for defensive purposes at home. It is gratifying to know that no fewer than 1000 factories are engaged upon aeroplanes, and that the output has trebled within the last 12 months. Americans have little idea of the enormous extent of allotment cultivation. In Birmingham alone, we have 5000 war allotments comprising 620 acres of ground, of which 400 acres are devoted to potatoes. It is estimated that this area will be sufficient to cover the winter requirements of 16,000 homes. The same kind of thing to a more or less degree has been carried on at other centers. A useful suggestion of the immense amount of work to be done after the war is given by the chairman of the housing committee in Birmingham who stated today that the scarcity of houses in this city is somewhere between 10,000 and 20,000 and that 50,000 houses in the old part of the town will have to be replaced. He states that after the war it will be necessary to build 5000 houses a year, at an annual expenditure of $1,250,000. What this means in the way of suspended industry, to be taken up on the return of peace, can be seen readily. Sheffield is in a very similar position, having for some time past demolished more houses than have been rebuilt. The council has adopted a scheme for the building of 800 houses per annum during the next five years.

Restrict Steel Exports to War Use

President's New Ruling Has Sweeping Effect on Foreign Trade Especially in Ship Steel—Japan Involved Heavily and Will Furnish More Vessel Tonnage for Allied Purposes—Future of Export Market Unsettled

WASHINGTON, Aug. 7.—More direct and absolute supervision of the steel industry of the country has been assumed by the United States government as the result of the order issued Aug. 2 by President Wilson placing an embargo on export shipment of certain steel products after Aug. 15. The order was in the nature of additional instructions to Secretary of Commerce Redfield for the guidance of the division of export licenses in future shipments of iron and steel products and explosives.

The new rules governing iron and steel shipments, which supersede all previous regulations, are as follow:

First—That all shipments to those nations associated with the United States in the war are, until further instructions, to be licensed freely, without reservation, and without restriction, except iron and steel plates, pig iron, iron and steel scrap, and steel billets, for which licenses shall be granted only in case said articles are destined for actual war purposes or will directly contribute thereto.

Second—Licenses which may be properly issued, will be granted for shipments of all iron and steel plates and structural shapes, and other articles properly included under these general headings, under the following conditions only:

(1) The application for such license must be received by the department of commerce, division of export licenses, Washington, on or before Aug. 10, 1917.

(2) Such articles shall be completely made up and manufactured on or before Aug. 10, 1917.

(3) Such license shall be valid, and shall indicate that it is valid only in case such shipments are covered by railroad or ocean bill of lading dated on or before Aug. 15, 1917.

Neutrals Fall in Line

Various interpretations have been placed upon the embargo which government officials refuse to discuss. There can be no doubt as to the accuracy of the general interpretation that it is designed to compel Japan to divert much greater shipping tonnage to the transatlantic trade. There is every reason to believe, however, that the Japanese government had fully agreed to do this before the order was issued. Japan will put more ships in the transatlantic trade and thus be assured a continued supply of ship steel.

Evidently one of the principal purposes of the embargo order is to prevent reexportation of steel products to Germany by neutral countries. This construction of the order seems to attain added significance by virtue of the fact that simultaneously with the announcement of the President's order, the Swedish government issued a proclamation carrying new and drastic regulations designed to prevent the export of brass, lead, copper, nickel and other base metals necessary in the manufacture of munitions. Similar regulations prohibiting exports are to be adopted at once by other Scandinavian countries and by Holland, according to information reaching the capital. The Swedish list, now in effect, prohibits the export of practically every variety of machinery, nautical and surgical instruments, wind instruments window panes, door frames and picture frames, "which contain any other base metal than iron."

The future status of exporting of the iron and steel products named remains to be determined. As it stands no shipments of these products will be permitted after Aug. 15. Moreover, these articles, in order to be exported, "shall be completely made up and manufactured on or before Aug. 10, 1917" or next Friday. Unfinished export tonnage of this character on the books of the steel companies at that time, apparently would have to be canceled, unless the President issues a supplemental order permitting its completion and shipment. There is a belief here that such an order will be forthcoming, both to release unfilled orders and to cover new foreign business.

No little interest is manifested here as to the effect this sweeping order will have on the steel industry. While it will be observed that the order covers ship steel, including plates and structural shapes, it is not overlooked that it also takes into account pig iron, scrap, and billets, which have been moving freely from the United States to neutral countries. Munitions are not named, but are covered by an existing policy providing that they shall be exported to Europe and only to belligerent countries allied with the United States.

Because the President's order will have the effect of abrogating all foreign orders for iron and steel products it includes after Aug. 10, increased speculation has been made as to whether the government is intending to take all of the ship steel capacity after that date, directing its distribution as it may see fit, with much of it for its own purpose.

Another feature of the President's steel embargo order that has aroused deep interest relates to a readjustment as to prices of steel to be used by this government and its allies. It has been claimed that one of the purposes of the order is to bring these to lower levels. The order of the President has also been construed in some quarters as being a preliminary to a plan to bring about a general readjustment as to the distribution of export shipments of steel to allied countries. In this connection, it has been asserted that the United States government may seek to have more steel and munitions sent to Italy

No Trouble With Japan

While it is believed to be true that diplomatic negotiations between Japan and the United States were taken up as the result of the Prsident's embargo order, no serious misunderstanding existed at any time, it is believed. Only about 4 per cent of Japan's ship tonnage is engaged in transatlantic trade while the other allies are using their tonnage freely. As quickly as the export council makes clear the meaning of the term "war purposes," as it pertains to shipping, the amount of American steel that may be exported to Japan will be determined. It is known that the Japanese government has a complete understanding with the United States government as to the distribution of American steel and is willing that a large portion of its shipping shall be used by the United States in the transatlantic trade for the entente countries.

Figures were given out here showing that contracts made by Japan and other countries allied with the United States with American steel manufacturers, which would be abrogated as the result of the order, would approximate $25,000,000 or more. Exports to Japan during the first 11 months of the fiscal year 1915 totaled 17,596,548 pounds of sheet and plates, valued at $339,654; for the same period of the fiscal year 1916, they amounted to 131,422,643 pounds, valued at $2,563,626, and for a similar period of the fiscal year 1917 they reached a total of 368,327,969 pounds, valued at $13,580,631. Increases of a similar character were shown as to other steel products exported to Japan. While in 1914 no wire rods went to that country from America, in 1915 exports of this product totaled 2,261,226 pounds, and for the 11 months of the fiscal year

1916 ending with May they amounted to 5,933,125 pounds. Other steel rods exported for military purposes increased as follows: 1914, 4,087,576 pounds; 1915, 30,975,780 and 1916, 185,856,318 pounds. In 1914 no steel billets were exported to Japan, but in 1915 that country took 191,532 tons, and in 1916, 196,554 tons. Exports of steel plates exclusively were as follows: 1914, 4,137,969 pounds; 1915, 21,286,245 pounds; 1916, 121,554,642 pounds.

Plan Great Works to Supply Troop Line

WASHINGTON, Aug. 7.—Undertakings are under way by the war department calling for heavy steel tonnages in connection with maintaining American armies in France. In an authorized statement a general outline of the work to be done in France is furnished. Large quantities of railroad and bridge materials, together with other supplies, will be shipped from the United States to carry out these plans.

An indication of the requirements of railroad supplies and rolling stock is supplied by the statement that their value is about five times that of all purchases made annually in this country for the Panama canal during the last four or five years. Some of this equipment and rolling stock now is being purchased. Tremendous operations in the construction and repair of bridges must also be performed by American engineers. They must repair and maintain the roads and highways over which supplies for American troops will be brought up to the battle line. To accomplish this work the same kind of street and road equipment as is used in leading American cities will have to be shipped to the front. Wharves and piers in France to be utilized by American forces will have to be equipped by American engineers. Electric plants will be installed to serve the trenches, dugouts, storehouses, etc. Experts already are in France studying the problem of furnishing an adequate water supply for large bodies of men. Material for extensive standard gage and narrow gage railroads will be sent abroad. The lines to be built will both transport the American troops to the front and handle all transportation behind the firing line. The engineer corps will carry its own rolling stock to the theater of war. Special mining companies will be formed for the purpose of carrying on intricate trench operations.

Battlefield illumination with searchlights, trench lights, flares, star bombs and rifle grenades will be handled by the American engineers. The engineers will attend to the construction of all buildings for the housing of troops. They will build hospitals, refrigerating plants, machine shops and other structures incident to caring for and supplying the army in France.

Dredging and other river and harbor improvements in this country is a necessary work to be undertaken. The opening of waterways to give freer play to movements of the troops as well as to relieve the congestion of land traffic is an important measure toward war time efficiency. Now that congress has passed the rivers and harbors bill, the engineers will undertake such improvements on an enormous scale.

The purchasing and supply department of the engineers' corps faces the task of buying the equipment to be shipped to the front. The item of intrenching tools in itself is a considerable one as the destruction in this line has been extremely large in the French and British armies. Wrecking cars and paraphernalia must be supplied. Complete equipment for the making of concrete also must be provided. The engineers must construct at harbors in the United States wharves, piers and storehouses of sufficient capacity to handle all materials and supplies to be shipped to France.

It will be the endeavor of the engineers to prepare accommodations ahead of troops. An efficiency system has been worked out to provide against delay in loading and unloading of supplies. Ample terminal facilities will be provided at ports on both sides of the Atlantic.

Ship Program is Pushed Vigorously

WASHINGTON, Aug. 7.—His belief that private ship yards are in a position to supply the requisite number of steel merchant vessels has caused Rear Admiral Capps, general manager of the emergency fleet corporation of the shipping board to hold in abeyance the plan of his predecessor, Maj. Gen. George W. Goethals, to construct two government yards for fabricating steel ships. Admiral Capps' position was made clear Saturday, in connection with the action of the board and corporation in requisitioning all merchant ships of more than 2500 tons now building in American ship yards. Admiral Capps evidently believes this plan will keep skilled labor mobilized more satisfactorily than if some of it were diverted to the government yards or additional men were trained. Riveters in particular are needed for fabricating steel ships, and the shortage of this class of labor is causing considerable apprehension.

The action of the board and fleet corporation in taking over ships being built in private yards came as no surprise. It is merely in line with a plan determined upon previously by General Goethals. The taking over of the ships is authorized by provision in the recently enacted urgent deficiency bill. Not only has the government taken over the ships being built in private yards, but it also has requisitioned all the machinery, materials, equipment, etc., necessary to their completion.

These vessels, approximately 250 to 275 in number, of about 1,000,000 tons, and the labor shift will be doubled and tripled. It is likely that producers will be asked to expedite deliveries of steel for the completion of these vessels. It is difficult to estimate the total steel tonnage required, but it probably will approximate 1,000,000 tons. About half of the ship tonnage under constructioin has been for British account and much of the remaining tonnage is for Norway.

What policy may be adopted as to compensating steel producers for material entering into the ships and the yards for building them is not known. This question, as well as that covering compensation to the foreign governments for which many of the ships were being built, is to be settled later. It is well known that the prices being paid for the steel entering into the ships and for the vessels themselves are considerably higher than this government proposes to pay in the future. An unconfirmed report has been current to the effect that contracts for steel and ships now building may be abrogated and readjusted to make them retroactive. In

its official announcement requisitioning the ships, the fleet corporation said the compensation will be determined hereafter and will include ships, materials and contracts requisitioned. Builders are required to furnish immediately general plans and detail specifications of the ships requisitioned, and copies of contracts and all supplemental agreements and full particulars as to owner, date of completion, payments made to date, amounts still due, and any other information "necessary to a fair and just determination of the obligations of the emergency fleet corporation in taking over these ships and contracts." The shipyards also are required to report immediately whether any additional contracts are under consideration and their character and extent. They will not be permitted to enter into any additional contracts for merchant tonnage without express authority from the corporation.

Chairman Hurley of the shipping board told THE IRON TRADE REVIEW that he had not yet had time to give careful study to the situation as to the supplying of steel and the building of steel vessels. It is the purpose of the board and corporation, however, to build as many ships, wood and steel, as possible and in the shortest time possible. The question as to type of ships to be built is not being considered.

A conference held last week with the lumber interests it is reported has showed that the wooden ship program can be increased by 20 or 30 per cent. This does not mean, however, that the number of steel ships to be built will be reduced. Simplified designs of wooden vessels are being proposed. One of the purposes of the meeting was to impress upon southern pine producers the necessity of meeting the requirements of the government more satisfactorily. So far the lumber has been furnished for 63 of the 100 wooden ships promised from the south. It has been claimed that the southern lumber yards have been neglecting the government's orders and accepting more lucrative private contracts. The lumber men protested vigorously that they were not "slacking", and they indicated the south could do much more than it has been doing. Some of the lumber producers objected to the price of $35 a thousand feet agreed upon with the government. The conference ended in an ultimatum that if the lumber were not forthcoming at once the government would take over the yards.

A conference between ship owners, members of organized labor and government officials considered the problem of obtaining masters and crews. The conference decided to name a committee representing employers, employes and government departments to work out an understanding by which more men for ships may be obtained.

The labor representatives, members of the seamen's union, voiced opposition to the employment of others than American citizens as officers on merchant ships and to the employment of non-union men. This protest prompted Secretary Redfield to tell the labor representatives that every day of delay on an American ship might result in the loss of 1500 American lives in France.

In addition to building steel and wooden ships, it is claimed that the shipping board is having experiments made on the development of a type of "unsinkable" ships. This plan is separate from the one providing for the construction of cargo carrying ships of the tank type, with which it might be combined, and its secret is said to rest in the building in of air boxes in the hulls between the ribs. The experiment, said to be under way in a southern yard, provides for boxes of thin wood covered with galvanized steel.

Want Iron and Wood Pipe for Army Camps

Washington, Aug. 7.—Special endeavors are being made by the quartermaster's corps, war department, to secure sufficient iron and wood pipe of the sizes needed for the cantonments where the new American army is to be trained. Reports of the progress of construction at the southern camps to which the national guard divisions will be sent have been assembled and it is shown that the first group of camps will be ready for occupancy less than two weeks after the date originally set, Aug. 1. The matter of securing labor has delayed work, but this problem has been about overcome. Camps in the other two groups will be ready for occupancy on Aug. 15 and Sept. 1, respectively, as scheduled. About 19 miles of piping is required for each camp.

Browning Machine Gun is Adopted for Army

Washington, Aug. 7.—Following an exhaustive investigation formal and official approval has been given by a board of the war department of the Browning machine gun for use by the American army. This gun is a British weapon, the American rights for its manufacture being held by the Colts Arms Co. Reliable reports have it that the board has recommended that the war department immediately purchase 20,000 of these guns, this number to be equally divided between the light and heavy types. Each gun will cost approximately $900 each, so that the total expenditure will be $18,000,000. While nothing has been given out as to where these guns will be manufactured, it is indicated from recent estimates sent to congress that large numbers will be produced at government arsenals, although heavy production may be required of private plants. Among estimates for the arsenals, which may have a bearing on the manufacture of the Browning machine guns are $2,630,000 for Frankford, $1,645,200 for Rock Island, $445,000 for Springfield, $741,500 for Watertown, and $500,000 for Watervliet arsenals. The board which conducted the investigation was headed by Brig. Gen. Francis H. French.

Adopt Specifications for Airplane Building

Washington, Aug. 7.—Specifications for materials determined upon by the aeronautical standards division of the Society of Automotive Engineers, acting in co-operation with the aircraft production board of the council of national defense, will be based on the best modern practice and experience in connection with the fleet of airplanes to be built by the United States government. With these specifications used as a standard for the machines, there will result greatly simplified requirements to which producers will be compelled to conform and thus promote quantity production, according to the division. The specifications for tension wires to be used in assembling the planes were adopted last week by the division, which also discussed aeronautical steel specifications. Automobile specifications adopted by the American Society of Testing Materials, with less phosphorus and sulphur were recommended. In the matter of engines specifications of the Society of Automobile Engineers were made applicable. Not much has been done with regard to specifications for sheets and tubing.

The Babcock & Wilcox Co., New York, manufacturer of watertube steam boilers, has commenced the erection of an addition to its plant at Bayonne, N. J. A contract has been placed for all steel required for the structure. All construction work is being done by the company itself No new equipment is to be purchased, as all initial requirements have been provided for.

Huge War Contracts Being Placed

Government Shows Great Energy in Distribution of Orders for Military Supplies of All Descriptions—Thousands of Machine Guns Placed—Aeroplane Construction Occupies Attention of Many Industrial Plants

NUMEROUS contracts for war supplies placed with manufacturers in all part of the country indicate encouraging progress on the government's plans for military preparations. The volume of new business being placed under the various programs being put forward is increasing from day to day. These contracts show that definite steps are being taken by the war boards to supply every necessity from revolvers to aeroplane motors and from cantonment buildings to steel and composite ships. An outstanding feature of recent war moves is the rapid strides toward building a huge air fleet. A realignment of industries to foster the production of essential war material rapidly is taking place. Many industrial plants the products of which in normal times apparently are far removed from war necessities are being pressed into the service of the nation. The personal and mechanical skill of these institutions along certain lines is being utilized in a surprising degree. This is notably the case in the building of aeronautical equipment. Piano and furniture manufacturers are among those who are being called upon to do their best in a productive sense in the turning out of aeroplane parts.

The Colt's Patent Firearms Mfg. Co., Hartford, Conn., is to build 20,000 machine guns, which the United States government expects to buy for the expeditionary forces. The ordnance board of the war department recommends the purchase of 10,000 of the heavy type of the Browning gun and 10,000 of the lighter type. The light type weighs but 14 pounds. The 500,000 automatic pistols which are being made for the new national army will be the only American-made small arm that will be taken by the new army to France.

The Smith & Wesson associates, Springfield, Mass., have received an order for 150,000 revolvers from the United States government. They are of the 42-caliber type. It will take a year to complete the contract. The company will build an addition to its plant.

The Graton & Knight Mfg. Co., Worcester, Mass., and the Jewell Belting Co., Hartford, Conn., have received a joint order from the United States government for 1,000,000 bayonet scabbards at a cost of about $1,500,000. All rifles used by the United States army hereafter will be equipped with them, using a fastening device fitting either a Springfield or an English Enfield rifle bayonet. Both companies have been making scabbards for the English government for three years. The Maxim Silencer Co., Hartford, Conn., has the subcontract for making the metal parts for half the entire order.

The Connecticut Electric Steel Co., Hartford, Conn., will furnish the New Britain Machine Co., New Britain, Conn., with 600 tons of steel castings for anti-aircraft gun mounts for the United States government. The New Britain Machine Co. will advance all funds necessary to double, approximately, the capacity of the Hartford plant, such advances to be paid out of the profits on the order for castings.

The Trego Motor Co., Fair Haven, Conn., is said to have received a $10,000,000 order from the United States government for airplane motors.

The Marlin Co., New Haven, Conn., has erected a hangar to receive the first two of several aeroplanes to be used to test bombs invented by L. P. Barlow. The company is manufacturing these bombs for both the army and navy. The new aerial experimental station will have facilities to handle 100 machines.

The Remington Arms-Union Metallic Cartridge Co., Bridgeport, Conn., has received a rush order from the government for nearly 500,000,000 cartridges for Springfield army rifles. Material for the order, consisting principally of brass stock, had been ordered to eliminate delay in delivery, as the contract had been anticipated for many weeks.

Additional contracts for 5750 motor trucks have been distributed by the war department. Of this number 3000 will be of the 3-ton Packard type, of which 1200 will cost $3197.39 each and 1800 $3836.87 each; 1200 will be Locomobiles at $4071.38 each and 1500 Pierce Arrows at $3500 each. The Locomobiles and Pierce Arrow trucks will be of the 1½-ton capacity. The quartermaster depot at Chicago has been instructed to buy 142 light trucks of large chassis and equipped with Babcock delivery bodies for the National guard cantonments at $750 each.

The Hall-Scott Motor Car Co., New York City, has been awarded the contract to furnish the government 750 Hall-Scott aviation engines, type A-7a at a price of $2366 each.

Twenty composite cargo-carrying vessels will be built by the Kelly-Atkinson Construction Co., Chicago, for the government. The contract, which was signed last week, places the time of delivery at December, 1918, and the total cost at $9,000,000. Each vessel will have a tonnage of 3500. The Kelly company has been in the steel construction business for

Government Buying Munitions Freely

The bureau of ordnance of the navy department will receive bids Aug. 15 on 700,000 one-pounder common projectiles.

On 50,000 shrapnel case forgings for the Frankford arsenal, the Bartlett-Hayward Co., Baltimore, bid $1.02 each, the contractor to furnish the steel; the Bridgeport Projectile Co., $2.08 each, and the Bethlehem Steel Co., $2.55 each. In the event that the government furnishes the steel the Bridgeport Projectile Co. offered to do the work for $1.44 each. On 1000 shrapnel case forgings, the contractor to furnish the steel, the Bartlett-Hayward Co. bid $1.02 each and the Bridgeport Projectile Co., $1.80 each for an 8-hour day or $1.83 each if the hours were unlimited.

On 50,850 3-inch common shell forgings for the Frankford arsenal, the Bethlehem Steel Co. bid $2.89 each; the Consolidated Car Heating Co., Albany, $1.97 each with an 8-hour day and $1.875 each for an unlimited day, both bids being based on the ability to obtain 3.75c steel; and the Bridgeport Projectile Co., $2.85 each for an 8-hour day and $2.90 each for an unlimited day.

The commanding officer of the Frankford arsenal has opened bids on 15,000,000 gallery practice cartridges, 0.22 caliber, of which 10,000,000 are for the New York arsenal and 5,000,000 for the Frankford arsenal, Philadelphia.

years, but never before has built ships. Several options on shipbuilding sites have been taken by the company and one on the Mississippi is favored. About $500,000 will be spent for yard and equipment.

Navy Places Many More Projectiles

Washington, Aug. 7.—About 2,000,000 more projectiles have been distributed by the chief of ordnance of the navy department. The Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa., has received 560,000 4-inch common projectiles; the American & British Mfg. Co., Bridgeport, Conn., 300,000 4-inch common projectiles; the American Car & Foundry Co., New York City, 650,000 3-inch common projectiles and the Consolidated Mfg. Co., Toledo, 300,000 3-inch class B projectiles. These contracts were placed under bids received July 11. The navy department has awarded to the Bethlehem Steel Co. 15,000 6-inch common projectiles at $22.87 each; to the Tredger Co., Richmond, Va., 2000 12-inch target projectiles at $45.90 each, the government to furnish rotating bands, and to the W. J. Oliver Mfg. Co., Knoxville, Tenn., 6-inch common projectiles at $21 each, the government to furnish the copper bands.

Airplanes Are Awarded

The Curtiss Aeroplane Co. has been awarded by the navy a contract for furnishing four flying boats complete, with power plant, at a price of approximately $35,000. This company also has received an order from the navy department to furnish two aeroplanes of the J N-4 type for approximately $36,000. Power plants and spear parts are also to be furnished.

Index is Ready

The index to Vol. LX of THE IRON TRADE REVIEW covering the six months from Jan. 1, 1917, to July 1, 1917, now is being distributed. The index is being sent only to those subscribers who have expressed a desire to be put on the mailing list.

Drop Higher Wire Rate

Because of opposition from New England wire manufacturers the three railroads operating in that section of the country have withdrawn their proposed new rate schedule to have become effective Aug. 10 to points west of Buffalo and freight rates will continue on the basis that has been in effect since their establishment, 28 years ago. There is, however, a strong possibility of a moderate increase by the railroads shortly. The manufacturers say they do not object to a moderate freight rate increase, but to a raise that will seriously impair their business. Under the proposed schedule wiping out the commodity rates, one manufacturer would have been called upon to pay an increase of 80 per cent. Increases to others would have been almost as high.

Begin Coke Plant

Construction of a battery of 120 Semet-Solvay by-product coke ovens at the plant of the Mark Mfg. Co. now building at Indiana Harbor, has been instituted by the By-Product Coke Corp. The By-Products Corp. will operate the ovens, the output of which will be used by the Mark Mfg. Co. in its blast furnace now being built in connection with its steel plant.

Erecting Forging Plant

The Edwin Forrest Forge Co., San Francisco, a new company organized by Edwin Forrest, for many years general foreman of the old Pacific Rolling Mill and the Risdon Iron & Locomotive Works, has purchased a site in East Oakland and started construction work on a $100,000 factory. The company will specialize in forgings of all kinds. An order for 40,000 steel axles already has been secured and the company anticipates a large volume of business from nearby manufacturers and shipyard owners.

Start Tin Plate Mill

The new tin plate mill of the Bethlehem Steel Corp., at Sparrows Point, Md., now is operating. Six of the 12 electrically-operated mills are running regularly. Production at the new plant will total 1,000,000 boxes yearly. The mill was constructed under the supervision of J. M. Jones, formerly general manager of the Massillon Rolling Mill Co., Massillon, O.

Form Ordnance Company

The Inland Ordnance Co., Cleveland, has been organized to manufacture medium-sized ordnance. The new company was formed through a reorganization of part of the McMyler Interstate Foundry Co., Cleveland, and is capitalized at $500,000. A new plant will be built as an addition to the present plant of the McMyler company at Bedford, O. Three and 4-inch gun forgings are now being made by the company on a contract recently let by the navy department. The officers are: Frank H. Ginn, president; R. W. Kaltenbach and Justin Griess, vice presidents; H. H. Hammond, treasurer; and W. Lovell, secretary. The directors include John Sherwin, George Coulton, Otto Miller and John L. Severence.

Offers Texas Ore and Stone to Government

Beaumont, Tex., Aug. 7.—Col. L. P. Featherstone, who on behalf of the Texas Steel Co., of which he is president, recently offered to enter into a contract with the United States shipping board to supply the government with iron ore for the manufacture of plates for ship construction, says that there is no question as to the ablity of his company to supply the necessary quantity of ore from its mines in East Texas. His offer to the government was on the basis of 10,000,000 tons of ore to be supplied during a period of six years. The proposition also contains an offer to supply coke and Texas lime stone.

The Texas Steel Co. has taken steps to construct a large open hearth plant here to cost about $1,000,000. In event the government should enter into a contract with the company to take these manufactured products, the latter plans to build a plant here for the manufacture of steel plates, which it is willing to sell to the government at $43.65 per ton.

Buying More Land

The Jones & Laughlin Steel Co., Pittsburgh, continues to buy additional land adjoining its South Side works. The latest acquisitions include two new parcels, each 20 x 73 feet, and one, 43 x 70 feet.

Will Make Threaders

The Columbus Machine Works, Inc., Columbus, Ind., through A. Boyd, secretary, advises that the recent incorporation of the company with $25,000 capital was for the purpose of manufacturing portable pipe threading machines. Officers of the new company are as follows: President, J. R. Dunlap; vice president, F. P. Boyd; secretary and treasurer, A. Boyd.

Quits Fittings Manufacture

Announcement has been made by the National Tube Co. that since the sale of its Kewanee, Ill., plant to the Walworth Mfg. Co., which was consummated Aug. 1, it has retired from the business of manufacturing pipe fittings.

Reduced Output

In Refractories Results From Torrid Weather—Inquiries Fall Off

The output of fire clay brick has been reduced fully 20 per cent by the extremely hot weather. Men at many plants are working only part time and, in addition, a labor shortage exists generally. Outbound shipments show no improvement, although material wanted for the manufacture of munitions is being moved with the greatest possible dispatch. The government is buying small quantities of fire brick, for experimental purposes.

Quotations on Pennsylvania fire clay brick, silica, magnesia and chrome brick are unchanged. Pennsylvania fire brick of first quality is listed at $45 to $55 per thousand, although makers in a position to meet specifications for early shipment frequently are selling at as high as $60 per thousand. Silica brick is selling at $50 to $60 in Pennsylvania. Magnesite brick continues to be quoted at a wide range, $135 to $160 per net ton. Chrome brick, which is extremely scarce, is quoted at $125 to $135 per net ton.

Sellers generally report prevailing uncertainty is reflected in a noticeable decrease in the number of new inquiries. This, however, is not causing producers particular concern as their deliveries are badly retarded and the tapering off of new business furnishes an opportunity for them to catch up on the unfilled orders on their books. On high grade brick and special shapes, however, the manufacturers have been unable to gain against accumulated business.

Refractories

(Per 1000 f. o. b. works.)

FIRE CLAY BRICK.
(First Quality.)

Pennsylvania	$45.00 to 55.00
Missouri-Illinois	$45.00 to 55.00
St. Louis, high grade	55.00 to 65.00
Ohio	45.00 to 50.00
Kentucky	45.00 to 55.00
New England	55.00 to 65.00

FIRE CLAY BRICK.
(Second Quality.)

Pennsylvania	$40.00 to 50.00
Ohio	37.00 to 40.00
New England	48.00 to 58.00

SILICA BRICK.

Pennsylvania	$50.00 to 60.00
Chicago	55.50 to 65.50
Birmingham	45.00 to 55.00

MAGNESIA BRICK.
(Per Net Ton.)

9 x 4½ x 2½	$135.00 to 160.00

CHROME BRICK.
(Per Net Ton.)

9 x 4½ x 2½	$125.00 to 135.00

BAUXITE BRICK.
(Per Net Ton.)

55 per cent	$40.00 base
76 per cent	100.00 base

Local Ores

Will be Used by Coast Steel Co. in Oregon Furnace

It is officially announced by the Pacific Coast Steel Co. that the blast furnace of the Oregon Iron & Steel Co. at Oswego, near Portland, Oreg., has been purchased as a precautionary measure, to insure the company a supply of pig iron during the present scarcity. The company states that the furnace will be operated on native ores and with coke produced in the northwest as long as prices remain satisfactory. In the meantime, it is hoped a supply of iron ore and coke may be developed which will permit of the manufacture of pig iron on the Pacific coast when conditions return to normal. At present, however, the company has no plans beyond the existing war emergency and reports to the effect that ores will be imported from the west coast of South America are without foundation.

The pipe foundry of the Oregon Iron & Steel Co., which is located near the blast furnace, was not taken over by the Pacific Coast Steel Co.

Ordnance Plant

Will be Built by Madison, Wis., Manufacturers for Government

A number of the largest manufacturers of Madison, Wis., including the Gisholt Machine Co., builder of lathes and tools, Fuller & Johnson Co., manufacturer of gasoline engines and machinery, and others, have organized the Northwestern Ordnance Co., with a capital stock of $100,000, to undertake government contracts for the manufacture of ordnance for the United States army. It is said that the new Corporation is being established along similar lines as the Wisconsin Gun Co., Milwaukee, organized by five leading manufacturers to build 3-inch field pieces for the government.

The incorporators of the Northwestern company are Carl A. Johnson, Harry L. Butler and Hobart S. Johnson. A plant similar to that now being built by the Milwaukee Gun Co. will be erected at Madison by the Northwestern company. These organizations were effected at the informal request of the war department, which intimates that it will take them over as soon as enabling legislation is passed by congress.

Explosive Making

Brings Heavy Buying of Coke By-Products—Lower Price Allowed

New York, Aug. 4.—Manufacturers of high explosives continue heavy buyers of toluol and phenol. Producers of toluol are sold up until March 1, 1918. Practically all their output now is being taken for government use. The ruling price in this business is $1.50 per gallon. Although the government did not formerly establish this figure, the $1.50 price was fixed upon in the first few contracts, and now it is generally accepted in all government orders. Sales have been made in the open market at as high as $2 per gallon at producers' plants, although the $1.75 price has not yet disappeared. While there has been considerable discussion about the substitution of other by-products for toluol in the manufacture of trinitrotoluol, to decrease the present shortage, nothing definite has developed; neither has

Further large sales of phenol are being made for export. Spot supplies continue scarce, but a little contract business is being done. Spot is being maintained at from 40 to 45 cents per pound. The contract market remains nominal as practically no future business is being done. Prices for pure benzol are unchanged at 55 to 60 cents per gallon, at producers plants, for both spot and contract.

Sales of sulphate of ammonia are confined to a few spot carloads. Makers have comparatively only small amounts on hand with which to supply hand-to-mouth buyers. Spot sulphate is quoted at $4.85 to $5 per 100 pounds at seaboard. Demand for solvent naphtha still is quiet. Quotations on spot range from 18 to 25 cents per gallon, and on contract from 18 to 22 cents.

Coke Oven By-Products

Spot.

Per Gallon at Producers Plant.

Pure benzol	$0.55 to .60
Toluol	1.75 to 2.00
Solvent naphtha	.18 to .25

Per Pound at Producers Plant.

Phenol	$0.40 to .45

Per 100 Pounds at Seaboard.

Sulphate of ammonia	$4.85 to 5.00

Contract.

Per Gallon at Producers Plant.

Pure benzol	$0.55 to .60
Toluol	1.50 to 1.75
Solvent naphtha	.18 to .22

Per Pound at Producers Plant.

Phenol (nominal)	nominal

Per 100 Pounds at Seaboard.

Sulphate of ammonia	nominal.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

WILLIAM L. WOLFE, formerly general manager of the Lackawanna Iron & Steel Co. interests at Lebanon and Cornwall, Pa., and later general superintendent of the Donaghmore plant of the Bethlehem Steel Co., has resigned his position with the latter company to become vice president and general manager of the Central Iron & Coal Co., Holt, Ala. Mr. Wolfe plans to assume his new duties about Aug. 15. The Central company owns and operates a large plant near Tuscaloosa, Ala., consisting of coal mines, coke ovens, ore mines, a large furnace and a pipe mill.

Clarence Seelye, paymaster at the P. & F. Corbin Division of the American Hardware Corp., New Britain, Conn., has resigned to take effect Aug. 18.

O. P. Ludwig, Birmingham, Ala., has been named general manager of the reorganized Dayton Coal & Iron Co. and has taken charge of his new duties.

J. H. Prior, chief engineer of the Illinois Public Utilities Commission, has resigned his place and will open an engineering office in Chicago.

David R. Cooper, designing engineer for the Power Construction Co., Worcester, Mass., has received a commission as captain in the engineering corps of the United States army.

E. G. Irwin, manager of the Cincinnati office of the Asbestos Protected Metal Co., Pittsburgh, has joined the Ohio national guard and this office, therefore, has been closed temporarily.

W. J. Gillingham, for many years associated with the Hall Switch & Signal Co. as general sales manager, has been named vice president of that company with headquarters in New York.

Carlos de Zafra has resigned his position with the Telautograph Corp. to accept the appointment of naval constructor with the Foundation Co., Woolworth building, New York.

J. R. Morehead, who has been attached to the Cleveland office of Rogers, Brown & Co., as a salesman, has been transferred to the Cincinnati office of that firm.

John Duncan, vice president of the Wheeling Steel & Iron Co., Wheeling, W. Va., who had a major operation on July 21, at the West Penn hospital, Pittsburgh, is making satisfactory progress toward recovery.

L. D. Albin, formerly assistant general sales manager of the Ingersoll-Rand Co., New York, has been chosen sales manager, succeeding J. H. Jewett who has been named vice president of that company.

Herbert W. Gepp, for some time general manager of the Amalgamated Zinc Co., has been chosen general manager of the Electrolytic Zinc Co. of Australia and will take up his new duties immediately. Mr. Gepp has been succeeded in the Amalgamated company by David Meredith.

Morris L. Sternberger Jr., president the Wellston Iron Furnace Co., Jackson, O., has been empowered by a court decree to change his name to Morris L. Stephenson. Samuel L. Sternberger, vice president and general manager of the same company likewise has been granted permission to change his name to Samuel E. Stephenson.

David F. Broderick, Hartford, Conn., efficiency expert in machine shop practice and inventor of the Broderick plating machine now in use in many manufacturing plants, has received a commission of major of ordnance in the United States army. He has had ordnance plant experience in foreign countries, including Germany.

Henry M. Wood has resigned from the Lodge & Shipley Machine Tool Co., Cincinnati, to become associated with Axel Malm in the Malm & Wood Machine Co., Dayton, O., manufacturers of rotary punch presses and dies. Mr. Malm is president and mechanical engineer and Mr. Wood vice president and general manager of the new organization.

Ford Corll has accepted a position as superintendent of the open-hearth department of the Cambria Steel Co. at Johnstown, Pa., having resigned a similar position in the Farrell, Pa., plant of the Carnegie Steel Co. Norman S. Powell, superintendent of the North Sharon open-hearth department will succeed Mr. Corll at Farrell, while Joseph Cooper has been named to succeed Mr. Powell.

Thomas F. Brown, a metallurgical engineer, who has been general superintendent of a large manufacturing plant in Farmington, Mass., and who recently was commissioned major of ordnance in the officers' reserve corps, has been ordered to Washington to report to the chief of ordnance for duty in the latter's office. He was assistant ordnance officer on Gen. John J. Pershing's staff in Columbus, N. M.

J. N. Lapointe of the Lapointe Machine Tool Co., New London, Conn., recently entertained Captain Girard of the French transport Konang-Si and 11 of his officers and crew.

Howard Britton Jr., formerly connected with the New York office of Manning, Maxwell & Moore, is now located in the Pittsburgh office of that company.

C. W. Owen, who recently resigned from his position as general sales agent for the Virginia Iron, Coal & Coke Co., Roanoke, Va., has been named secretary, treasurer and manager of the reorganized Old Dominion Coal, Iron & Coke Co., Roanoke, which will operate Virginia Coal properties. J. B. Newton, president of the Old Dominion company, is president of the Virginia Iron, Coal & Coke Co.

Frank I. Ellis, who was engaged by the Jones & Laughlin Steel Co., Pittsburg, to design, build and put into operation a new pipe mill at Woodlawn, Pa., has opened an office as a consulting engineer at 2126 the Farmers Bank building, Pittsburgh. For 12 years, Mr. Ellis was chief engineer of the United Engineering & Foundry Co., Pittsburgh, and later was manager of the plant of the Mark Mfg. Co., Chicago, at Zanesville, O.

Robert F. Herrick has secured the $200,000 worth of common stock of the Whitcomb-Blaisdell Machine Tool Co., Worcester, Mass., which gives him a controlling interest. He also controls the Reed-Prentice Co., in the same city, the two combined being about the largest maker of machine tools in New England. No change in the executive management of the business is contemplated, this being in the hands of Charles E. Hildreth, president and general manager, who is general manager of the National Machine Tool Builders' association.

Gulf Shipyard

To Be Built Along with New Steel Plant of Tennessee Company

Birmingham, Aug. 7.—The Tennessee Coal, Iron & Railroad Co. is to become interested in shipbuilding, and is contemplating the erection of a plant at Mobile, Ala. It is understood that the ship plant will be constructed to fabricate ship steel from the new Fairfield works of the Tennessee company, now under construction and on which from $11,000,000 to $30,000,000 is to be expended. The plans of the shipbuilding plant will be announced later.

The following statement has been given out by President George Crawford of the Tennessee Coal, Iron & Railroad Co.:

"The Tennessee Land Co., a subsidiary of the Tennessee Coal, Iron & Railroad Co., has purchased several ownerships of land near Mobile, consolidating an area fronting on the Mobile River and Chickasawbogue, suitable as a site for a shipbuilding plant."

The new Fairfield works of the company is expected to be completed in about 18 months.

Development of the Warrior river transportation facilities from the Birmingham district to Mobile is expected to be carried out after the Fairfield extensions are well advanced and the shipbuilding plant is under construction.

New Special Steel Plant Begins Production

Construction work, under way for the past five months on the new plant of the Cayuga Tool Steel Co., Auburn, N. Y., has been completed and rapid progress now is being made in the installation of equipment. Several units of the plant already are operating and with the completion and tuning up of its two 28-pot crucible melting furnaces, two electric furnaces, hammer plant and rolling mill, the company will commence regular production of crucible and electric furnace, straight carbon and alloy steels. Included in the personnel of the organization are the following: President and general manager, Charles M. Hammond, formerly president of the Halcomb Steel Co., Syracuse, N. Y.; vice president and sales manager, Thomas Towne, who also is vice president and general manager of the Swedish Iron & Steel Corp. and formerly was connected with the Union Drawn Steel Co., Beaver Falls, Pa.; secretary, William J. Henry, who also is president of the Henry & Allen Co., Auburn, manufacturer of drop forgings, machinery, etc.; treasurer, William K. Payne, also vice president of the Cayuga County National bank, Cayuga; directors, including the officers, A. E. Ballin, president of the McIntosh-Seymour Co., Auburn, Charles H. Burke, New York, president of the Swedish Iron & Steel Corp., and Timothy A. Leary, New York, attorney.

By-Product Plant

Is Under Consideration by Furnace Interests in the Nashville District

Nashville, Tenn., Aug. 7.—Construction of a large by-product coke plant by iron-producing interests of this section is under consideration. It is thought the recent organization of the Sewanee Iron Co., which is to put into blast the two blast furnaces at Grand Rivers, and the future developments of the Bon Air Coal & Iron Corp., will require a large supply of nearby coke. At the present time there are eight furnaces in the Nashville district requiring about 1200 tons of coke daily. Furthermore the Chicago-Tennessee Coal & Coke Co. has completed preparations for putting into operation 120 beehive coke ovens with a capacity of 6000 tons a month, at Waldensia, on the Tennessee Central railroad. The Sewanee Iron Co. has contracted for the entire output of the Waldensia ovens for its Grand Rivers furnaces. The Tennessee Central probably will build an extension into the heart of the Cumberland coal fields.

A large quantity of ore has been purchased from the Alabama Fuel & Iron Co. by the Sewanee Iron Co. A tract of 750 acres of ore land adjacent to the property of the Alabama Fuel & Iron Co. in the Russellville district, and owned by the Sewanee Iron Co., will be used as a site for an ore-washing plant to be installed preparatory to the beginning of mining operations by the latter company.

Appraise Sloss Properties

Birmingham, Ala., Aug. 7.—An appraisement of the properties of the Sloss-Sheffield Steel & Iron Co. has been made by three disinterested experts, W. L. Kluttz, general manager of the Sheffield Coal & Iron Co., H. S. Geismer, engineer and expert coal and ore man and Warner Shook, expert coal and coke man. It is understood that the valuations were made for the new president, Waddill Catchings, and directors and it may be the precursor of important improvements. The Sloss-Sheffield company has had in contemplation the building of a large by-product coke oven plant near Birmingham and is making other betterments and improvements.

Plant Explosion

Handicaps Canadian Car & Foundry Co.—Munition Workers Laid Off

Toronto, Aug. 6.—At the annual meeting of the Canadian Car & Foundry Co., at Monteal, Senator N. Curry, the president, stated that orders on the company's books now amounted to over $35,000,000, much of it in regular lines of manufacture. So much of the floating capital was needed to carry on the business, he said that dividends on preferred stock would be withheld until the assets were of a more liquid character. He explained that the company was in a fair way to complete its Russian contracts with a substantial margin of profit when the plant at Kingsland was destroyed—the greater portion of the loss falling on the Russian government. The Kingsland plant carried about $3,900,000 insurance, of which it was estimated that at least $3,500,000 would be collected, but of this sum $875,000 has yet to be paid. The underwriters had offered $550,000 as a compromise which the company was not prepared to accept. The Fort William, Ont., plant is being put in condition for operation and it was expected to commence shipments of cars from this plant in October.

Owing to further curtailments in government orders for shells, many munition workers are being laid off. On Aug. 1 the Canadian Fairbanks-Morse Co. discharged all its female workers, numbering about 600, and also 200 men. So far as the women are concerned, the reduction is likely to be permanent.

Sir Thomas White, Canadian Finance Minister, has announced in the House of Commons at Ottawa that the government will take over the entire Canadian Northern Railway system, including branch lines, terminals, telegraph and express services, grain elevators, steamship lines and other subsidiary undertakings. This will be done by the purchase of the $60,000,000 of the stock, which is not already owned by the government. The price to be paid for the stock is to be fixed by arbitration. The acquisition of the Canadian Northern and its subsidiaries will add about 9513 miles of railway to the government system with large terminals in nearly every city, giving it control of a complete railway, telegraph and express service from ocean to ocean. Sir Thomas White also intimated that he looked forward to the government some day acquiring the Grand Trunk Pacific system, but that for the present its difficulties would be met by a loan of $7,500,000 to tide it over the coming year.

Iron and Steel Financial News

Up-to-the-Minute Fact and Comment Collected and Sifted For Busy Readers

Nation's Business Travels Unknown Paths

EVER since Aug. 1, 1914, the country's business community has been confronted with uncertainty. When, at various short intervals, the economic skies seemed clear, the problem of "After the war—what?" appeared, to perplex the minds of business sages. But now thoughts of economic alliances, trade wars and the like have been shunted into the background in the press of America's preparation for war. Never, in the years since the beginning of the war nor in many years preceding it, has the business atmosphere been so charged with portentious events. Uncertainty as to where these developments are leading and their effect upon business are puzzling the minds of buyers and sellers of commodities, stock market operators and all the widespread groups whose ability to read the future, gages the successful conduct of their business.

In no field is this uncertainty more sharply defined than in the iron and steel industry. Producers of materials do not know what prices they will receive for goods now being sold the government and will not know until the federal trade commission has determined costs, months hence. They do not know what proportion of their output will be required by the government. They do not know what arrangements eventually will be made for supplying the needs of our allies. Buyers have not wholly forgotten the President's recent suggestion of maximum prices to the public. Exporters are being confronted with new and drastic export license regulations which restrict exports of certain classes of iron and steel when not destined for war work. This ruling automatically may wipe out millions in profits on business which has been regarded as gilt-edged. The question of war taxation is still undecided. Steel company statisticians are being obliged to estimate the taxes to be levied on their enterprises, when these companies' periodical income statements are issued.

England's Situation a Test?

England's progress toward national organization in the three years of war is the best index as to what our own course may be. Yet even this gage is of only limited use, for Great Britain's problems have differed widely from our own. She had, at the beginning of the war an industrial organization but one-third the size of ours, and a population less than half as large. But she has taken 5,000,000 men from her best working class, produced munitions in abundance and, in addition maintained in wonderful measure her export trade. At present, in England, a man may not hire an ordinary employe without a permit and in the fixed order of certain established priorities of delivery. The government may requisition any man's property. It can fix the price of anything or prohibit purchase or sale. It is a criminal offense for a workman or an executive to slacken in his work. There is now agitation in England over "conscript labor service," a term which is self explanatory. Our own government may take any or all of these steps. England waited years to enforce military service. The United States lost only a little time in adopting the same policy.

How far the United States government will go in its industrial co-ordination, no one may predict with accuracy. The immensely superior industrial facilities of this country, the limitations of ocean transportation and the large needs of a population spread over a wide territory may cause a relatively larger proportion of the nation's industrial activities being devoted to peace purposes than is the case in Great Britain. But, even now, many plants in certain lines are booked more than a year ahead on war work, the government directing the priority of shipments. This government control of plants, in effect if not in name, is steadily being extended with the progress of our preparations for war.

War conditions assure a heavy demand for iron and steel. Plants will keep active despite the uncertainty of the times. But business men generally have no idea what their profits will be nor what portion of their profits will be taken by taxation. They realize they will have to make sacrifices and are facing the situation squarely, patiently and willingly, trusting that they will receive fair treatment from the government.

With producers of materials themselves in doubt as to what their net profits will be, the doubt in the minds of stock investors and speculators can readily be appreciated. Consequently the stock market continues to mark time, with day to day fluctuations influenced largely by developments at the nation's capitol.

Senate Takes Up Modified War Tax Bill

WASHINGTON, Aug. 7.—Carrying levies totaling $2,002,000,000, and including important and administrative provisions affecting income and war profits taxes, the war revenue bill now is before the senate for final consideration. It is the hope of administration leaders to dispose of the bill within three weeks. It is doubted seriously in some quarters that this can be done. For one thing, it will be opposed vigorously by Senators LaFollette, Gore and Thomas, who have said they would submit a report urging higher levies on incomes and corporation. Chairman Kitchin of the house committee on ways and means is also opposed to the senate bill. If it passes the upper house without much change, it probably will be the object of prolonged attack in conference and in the house when reported back.

The new administrative provisions affecting income and war profits taxes authorize the treasury department to permit or require monthly installment payments on such taxes between March and June 25, of each year, when they are payable. Among those who have urged that the corporation war taxes be spread over quarterly

payments is a prominent steel manufacturer. He pointed out that, by taking these taxes at one time, sharp contraction and readjustments would be forced in various communities through the large withdrawals of money from the banks and from circulation. This steel producer advocated that the measure be enacted into law before congress adjourns, and that is the plan, so that the corporations may know the amount of their taxes and be in a position to fix their contributions to the next Liberty loan.

Total Increased Many Millions

The bill, as completed by the senate committee, represents an increase of $133,000,000 over the amount carried in the house measure. Approximately $327,000,000 was added last week by the latest war estimates. The increases have been arranged, as a general thing, through providing the following additional levies:

On corporate incomes, $162,000,000; additional surtaxes on individual incomes of $15,000 and over, $27,500,000; distilled spirits, $95,000,000; beer, $12,500,000; floor, or stock taxes on coffee, sugar, tea and cocoa, $6,000,000; wines, $17,000,000; war excess profits, $5,000,000; bank checks, $2,000,000. The additional tax on incomes of corparations also applies to partnerships, joint stock companies and associations, including life insurance companies. Their normal tax is increased to 6 per cent, or 2 per cent more than the house bill provided and the senate committee originally proposed. Increased surtaxes apply only to persons having incomes of $15,000 or more. They range from 1 per cent on $15,000 incomes to a maximum of 33 per cent on incomes in excess of $500,000. There also has been inserted a new provision allowing a flat $5000 exemption for individuals from the war excess profits tax. The $15,000,000 increase on war excess profits was added by minor changes in the schedules of such taxes providing for a total revenue of $528,000,000.

Claims Steel Corporation Gains

Among the reasons given by Representative Kitchin for his attacks on the senate bill is that it carries a provision exempting from income taxation all corporation dividends received from other corporations, which, Mr. Kitchin had been sought by the United States Steel Corporation, the Bethlehem Steel Corporation and other large business interests. He said the United States Steel Corporation alone will benefit to the extent of $10,800,000 because of this exemption.

Reductions from 10 to 15 per cent in the proposed tax on undivided surplus of corporations, joint stock companies and associations have been determined upon. The levy on undistributed surplus practically is a surtax on corporate incomes, which now pay only a flat tax, while indivdiual incomes are surtaxed. Reduction of the rate to 10 per cent followed the committee's recent decision to treble the normal corporation tax, which will raise $162,000,000 more revenue from that source. It has been proposed to raise $25,000,000 from the 15 per cent rate. The 10 per cent tax will net considerably less, as in addition to the 5 per cent reduction the committee decided to exempt from the 10 per cent tax the surplus that is "actually invested and employed in business or retained for employment in the reasonable requirements of the business."

A new clause added to the war profits section provides a standard for calculating tax exemptions of those claiming that their pre-war profits were subnormal. Under the plan, where the secretary of the treasury finds exemption claims are justified the company would be entitled to the same allowance as to new corporations not in existence before the war, the income of which would be based upon the earnings of companies or individuals engaged in the same general line of business.

Midvale Allows Heavily for War Taxation

The Midvale Steel & Ordnance Co. for the quarter ended June 30 reports a balance, after charges, of $12,224,302, after deducting reserve federal taxes, depreciation and interest charges. This compares with $12,026,687 at the end of the first quarter of 1917. Net earnings increased $3,106,397 in the quarter. The comparative report follows:

	June 30	Mar. 31	Increase
Net earnings	$18,966,135	$15,859,738	$3,106,397
Federal taxes	4,619,524	1,636 755	2,982,769
Interest	816,521	814,456	*76,052
Res. for deprec. ...	1,305,788	1,381,840	*76,052
Interest	816,521	814,456	2,065
Bal. af. chgs.	*12,224,302	12,026,687	197,615

*Decrease.

The balance after charges is equal to $6.11 a share during the three months on 2,000,000 shares, or at the annual rate of $24.44 on the $50 par stock.

Steel Foundries Almost Trebles Earnings

Earnings of $3,948,197 are shown in a report of the American Steel Foundries Co. for the six-month period ended June 30. This compares with earnings of $1,374,226 for the same period of last year. After the deduction of charges, etc., a surplus of $3,684,780 remains, which compares with a surplus of $1,022,815 for the same period of last year. The surplus is equal to 21.44 per cent on the $17,184,000 common stock, or at the annual rate of 42.88 per cent. At a meeting of the board of directors, it was voted to retire $1,300,000 first mortgage 6 per cent bonds on the next interest date, which is Oct. 1.

Obituaries

J. H. Molins, president of the American Bolt Co., Birmingham, Ala., died a short time ago at his home in that city.

Dr. Robie Blake, a pioneer electrical inventor, died in Cornish, Me., recently, aged 79 years.

Isaac G. Haas, for many years president of the Empire Plow Co., Cleveland, died Aug. 1, following a lingering illness.

Edwin J. Piper, inventor and manufacturer of the Springfield ruling machine, died at his home in Springfield, Mass., Aug. 1, aged 86 years.

Martin Green, a pioneer railroad builder and civil engineer whose work had extended to various parts of the United States, died at his home in Worcester, Mass., recently, aged 89 years.

Jesse Hough, sales representative of the National Lock Washer Co., is dead at his home in Indianapolis, after an illness of seven months. He had been associated with this company more than four years.

Raymond S. Lewine, for the past two years an electrical engineer at the south works of the American Steel & Wire Co., Worcester, Mass., died in Holden, Mass., Aug. 1, from the effect of the heat, aged 33 years.

Alfred J. Ormston Jr., superintendent of motive power of the Jones & Laughlin Steel Co., Pittsburgh, at Woodlawn, Pa., died recently in the South Side hospital, Pittsburgh, from injuries received while at work. At one time, Mr. Ormston was instructor in mechanical engineering in the Carnegie Institute of Technology.

Frank G. Hayward, president of the Bristol Mfg. Co., Bristol, Conn., from 1902 until January, 1916, died at his home in that city, Aug. 1, after a long illness, aged 76 years. He became secretary of the company in 1875, and later became president. He was also actively connected with the Horton Mfg. Co., and the New Departure Mfg. Co., both of Bristol and was one of the original directors of the Bristol Brass Covering Co.

Huge Buying for France is Planned

Government Will Require Great List of Tools for Extensive System of Field Works and Supply Lines Behind American Front—No Large Domestic Inquiries Are Out But Good Buying is in Prospect

MUNITION makers are figuring actively in the eastern machine tool market. No large lists have been issued during the past few days, but a fair number of small inquiries have been coming out in much better volume than in the preceding week. The effect of this demand is continually being reflected in the steadily increasing scarcity of equipment. Builders of punches and shearing machinery, as previously reported, are booked up months ahead, and in several instances are out of the market entirely. Shapers and boring mills also are exceedingly scarce, and some builders report orders for this latter type for delivery throughout 1918. In the instance of grinders, however, the situation appears slightly easier.

A number of inquiries from France are in the market at this time for miscellaneous tools. In addition, the United States government is interested in about $2,000,000 worth of machine tools for export to France for the upbuilding of a great system of miscellaneous field works, railroads, supply lines, etc., to serve the front held by American troops. The Pennsylvania railroad received bids for the United States government on Aug. 2 for a number of boring and turning machines and lathes for this work.

Plans for Shipyards Temporarily Shelved

The week in Washington with regard to the government's shipbuilding program has brought relatively few developments of interest to the machine tool trade. Plans for the construction of two government-owned shipyards, as proposed by General Goethals, have been temporarily laid aside by the new board, and will be taken up for consideration later. Rear Admiral Capps, it is understood, is opposed to the form of contracts proposed by General Goethals, and the whole project possibly may be abandoned. With regard to the activities of the shipping board, it is reported that the Henry Smith & Sons Co., Baltimore, has just recently been awarded contracts for eight wooden ships by the Emergency Fleet Corp., and that the company has purchased 10 acres of waterfront at Curtis creek for the erection of a modern shipyard. Among other comparatively recent developments is the report that the government has asked the Bullard Machine Tool Co., Bridgeport, Conn., to build a plant, costing over $5,000,000, for the manufacture of heavy guns.

The market on cranes continues quiet. The Federal Shipbuilding Co., which now is erecting a $6,000,000 plant near Hackensack, N. J., is negotiating for a large number of cranes, hoists and other equipment, but, so far as can be learned, has not as yet placed any contracts. The Groton Iron Works, Groton, Conn., has bought three cranes, of 15 to 20 tons capacity, from the McMyler Interstate Co., and also has placed orders for two or three Terry shipbuilding cranes. The Lone Star Shipbuilding Co., of Texas, is reported in the market for one or two cranes. The Downey Shipbuilding Co. has placed orders for an assortment of tools, and still is in the market. The Southern Pacific railroad is inquiring for two cranes of 15 and 20 tons capacity each. The Lehigh railroad, which recently was inquiring for a gantry crane, is understood to have withdrawn from the market.

Chicago Buyers More Active

QUICKENING in the demand for machine tools is noted after a fairly quiet period and dealers believe a buying movement will shortly be under way. At present, the call is largely for single tools of heavy type. Buying of motor trucks by the government has brought out some lists which were closed late last week. Prominent among these is one by the Nash Motors Co., at Kenosha, Wis., and by the Buda Co., at Harvey, Ill., the latter having a subcontract from the former. The Four Wheel Drive Auto Co., Clintonville, Wis., has a contract for trucks, but has not yet inquired for additional equipment. A number of inquiries call for either new or second-hand horizontal boring machines, radial drills, vertical boring and turning mills, heavy millers and planers. These tools are difficult to obtain. The Chicago & Northwestern railroad has closed for part of its large list, but is not expected to buy the remaining tools at present. The Hurley Machine Co. is adding to its new plant in Chicago and is seeking equipment. The Continental Can Co. is also in the market for machine shop equipment for its new plant. The Overland Automobile Co. has taken a contract for airplane motors and is adding to its facilities. Government requirements for airplane engines are expected to give considerable impetus to machine buying and as soon as the type has been standardized and perfected. An embargo on exports has tied up considerable machinery en-route, and manufacturers are able to deliver some machines to domestic users promptly in view of the fact that they cannot be shipped on export orders. The Bradford Supply Co., at Robinson, Ill., will build two machine shop additions; the Standard Spiral Pipe Co., Chicago, will rebuild its burned plant and will need forging equipment. The Freeport Engine works is adding a machine shop; the Michigan Drop Forge Co., Pontiac, Mich., is building additions, and the Linderman Steel & Machinery Co., Muskegon, Mich., is preparing to spend $5,000,000 for a plant to manufacture gun mounts and projectiles. The Edwin Forrest Forge Co., Oakland, Cal., will build a forging plant to handle large work. The Marine Pipe & Machine Works, Seattle, Wash., will build a machine shop, and the Monroe Power Screw Co., Shawnee, Okla., is in the market for electrically operated equipment. Red Rock, Okla., is preparing to install a waterworks system, including a triplex pump, oil engine and tank. Ft. Madison, Iowa, will enlarge its waterworks by the installation of two 42-inch centrifugal pumps, electric motors, and a 10-ton traveling crane.

Government is Big Factor in Pittsburgh

A WAR-TIME market rapidly is developing for machine tools in the Pittsburgh district. The situation is being dominated by the government and by manufacturers of munitions in various sections of the country. Closely associated with a recent order for 150,000 tons of 80-pound rails for the construction

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Chicago Office: Room 1370 Peoples Gas Bldg., 122 South Michigan Blvd.
A. Schaeffer, District Sales Manager.
Philadelphia Office: 902 Widener Building.
Frank Wallace, District Sales Manager.
J. E. Dockendorff & Co., General Export Agents, 20 Broad St., New York.

Say you saw it in THE IRON TRADE REVIEW

of tracks behind the American front in France, is the inquiry for about $2,000,000 worth of machine tools for repair shops in France, bids on which came out a short time ago. The Youngstown Foundry & Machine Co., Youngstown, has received an order from the Donner Steel Co., Buffalo, for an 8-inch and 10-inch mill, and, in addition, has received a number of contracts for shears, lathes and spike machines. The Alan Wood Iron & Steel Co., Ivy Rock, Pa., has placed contracts for a 500-ton blast furnace, to be erected at Swedeland. The Baldwin Locomotive Works is reported to be offering 700 lathes, used for the manufacture of shells for Great Britain, in the market for second-hand equipment.

Cleveland Dealers Find Market Easing

CLEVELAND machine tool dealers find that the demand for shop equipment is drooping. This is believed to be due to the fact that the summer lull, late in arriving, is just putting in its appearance. Inquiries continue to appear calling for a miscellaneous lot of tools, but the activity of the past week far from equals previous high marks. The Hayes Mfg. Co., Erie, Pa., is in the market for a horizontal tapping machine capable of handling ½-inch to 2-inch pipe threads. The Allen Machinery Co., Erie, Pa., is in the market for one 24-inch back-geared shaper with a 28-inch stroke. The Cleveland Pneumatic Tool Co., Hawthorne avenue, Cleveland, is understood to be in the market for one vertical miller, three 14-inch lathes with 6-foot beds, several high-speed drill presses, one 20-inch drill press, one plain No. 1 or No. 2 miller, and one or more boring mills. The Lang Auto Body Co., Cleveland, which has purchased a tract of ground and will erect a modern plant, will be in the market shortly for a wide line of woodworking tools as well as some metal-working machines. It is thought by local tool dealers that this business will appear before the machinery houses as a formal list and it is believed that this inquiry will make its appearance in about 30 days. Price advances have been announced by one builder of lathes, effective immediately. This is an average increase of 12 per cent. One builder of cold metal saws has advanced prices 10 per cent, effective immediately. Both of these builders state that the increasing costs of labor and raw materials made necessary these changes. Deliveries on most lines are about the same.

Tools Bought by Scandinavian Interests

BUYING of machine tools by the Scandinavian countries has lately assumed important proportions. These orders have been placed with the understanding that when completed, the machines would be paid for and stored in this country for the purchaser's account. The move is evidently one intended to discount the future and to be ready to take an important part in the reconstruction work in Europe after the war. The domestic demand for machine tools, of the larger sizes, is improving.

New Construction and Equipment

Concise and Timely Business Building Opportunities from the Field of Industry

Among New England Factories

BRIDGEPORT, CONN. — The Bridgeport Gun & Tool Co., recently incorporated with $25,000 capital by Maj. Joseph G. Woodbury, ordnance department, U. S. A., George R. Davies and Fred Lacey, will make gun tools for use in the United States navy.

BRISTOL, CONN. — The Wallace Barnes Co., maker of steel springs, has let contract for brick, 5-story, 60 x 107-foot manufacturing building, with 40-foot wing.

BURLINGTON, CONN.—The Queen City Cotton Mills has let general contract for 1-story, 118 x 302-foot mill to the McNally Building Co., Framingham, Mass.

ESSEX, CONN.—The Dauntless Shipyard, Inc., has been incorporated with $50,000 capital by Charles A. Goodwin, George H. Day, and I. M. Topliff.

HARTFORD, CONN.—The Bennett Metal Treating Co. is building factory in Elmwood, Conn.

HARTFORD, CONN. — Isidore Wise will build a brick and terra cotta, 8-story, 72 x 104-foot building on Pratt street.

MIDDLETOWN, CONN. — The Wilcox, Crittenden Co. will build a steel and reinforced concrete, fireproof, 1-story and basement, 40 x 90-foot foundry.

NEW HAVEN, CONN.—The New Haven Rivet Co. has been incorporated with $5000 capital by Henry C. Smith, Dudley Stafford and Frank S. Day.

NEW HAVEN, CONN.—The general contract for central power station for Yale university has been let to the C. A. Dodge Co., Cambridge, Mass.

NEW HAVEN, CONN.—The New York, New Haven, & Hartford railroad will build a brick and terra cotta, 1-story, 95 x 360-foot addition to contain 18 stalls to its round house at Cedar Hills.

NEW LONDON, CONN.—Bids close Aug. 20 for a storehouse to cost $125,000 for the United States government at the submarine base.

PLAINVILLE, CONN. — The Rockwell-Drake branch of the Marlin-Rockwell Corp. will build another factory on Woodruff avenue, with 13,000 square feet of floor space. The plant is to be used for the production of double-row ball bearings.

STAMFORD, CONN.—Fire practically destroyed the plant of the Baer Bros. Co., Aug. 1, with a loss of $300,000.

HALLOWELL, ME.—Bids close Aug. 11 for a brick and stone, 2-story, 50 x 122-foot high school for the city at Warren and Central streets.

SOUTH FREEPORT, ME.—The Freeport Shipbuilding Co., recently incorporated with $100,000 capital by Jules S. Soule, William G. Soule, Thatcher Soule, Hermon C. Soule and H. B. Shonk, has taken over the Enos Soule shipyard.

SOUTH PORTLAND, ME.—The Moulton Engineering Corp., is preparing plans for a 3-way shipyard with full equipment for J. H. Hamlen & Son.

BOSTON. — The Trimount Mfg. Co. will build a brick, 2-story, 46 x 85-foot office building at 61 Amory street.

BOSTON.—The Massachusetts Zinc Co. has been incorporated with $100,000 capital by Horace J. Martin, Lionel Normand and E. M. Churchill.

BOSTON.—The Bay State Insulated Wire & Cable Co. has been incorporated with $300,000 capital by John H. H. McNamee, Daniel T. O'Connell and M. J. Cashman.

BOSTON.—The Bigheart Petroleum Refining Co. has been incorporated with $750,000 capital by Stanley L. Smith, Earl G. Hastings, George D. Locke and others.

BOSTON.—The Robert B. Campbell Co. has been incorporated to make machinery with $25,000 capital by Robert B. Campbell and F. L. Moreau.

BOSTON.—The American Cement Ship Co. has been incorporated with $99,000 capital by

What Is Worth Exporting Is Worth Exporting Well.

Half hearted attempts at exporting mean nothing more than wasted money and wasted effort. And further than this they injure the prestige of American business abroad. Exporting is not a "game". It is a legitimate business that deserves the attention of the men in the highest authority in any company.

FEDEX has taken a strong position in this matter. It will not sell an American product which fails to measure up to a standard. It sells goods on their merits. And, in its markets overseas, it has proved that price alone is no criterion of the sales possibilities. It is the quality of the product that counts.

Selling abroad on a basis of the business to be had, requires a department so organized that it will eliminate every possibility of friction between the American manufacturer and the foreign purchaser. FEDEX is such a smooth working organization and it is ready to take over the export sales of any American manufacturer whose product is dependable.

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FEDERAL EXPORT CORPORATION

115 Broadway, New York

SHIPOWNERS EXPORTERS BANKERS

Harold W. Loker, and Warner V. Taylor, Wakefield, Mass.

BOSTON.—The Crowninshield-Swasey Shipbuilding Corp. has been incorporated with $300,000 capital and has taken over the Read yard in Somerset, B. B. Crowninshield, Harold S. Krogman and others are the incorporators.

FALL RIVER, MASS.—Cherry & Webb have let the contract for a brick and steel, 2-story, 38 x 163-foot building to cost $30,000 on South Main street.

PALMER, MASS.—The Palmer Foundry & Machine Co. has been incorporated with $15,000 capital by Michael A. Henebery, William A. Scollen and William C. Mellish, all of Worcester, Mass.

PALMER, MASS.—Dean & Sherk, Detroit, Mich., who have purchased No. 3 mill of the Wright Wire Co. will build 75 x 175-foot storehouse.

SOMERSET, MASS. — The Crowninshield-Swasey Shipbuilding Co. has been incorporated with $300,000 capital by Bowdoin B. Crowninshield, Clarence T. Birkett, and H. W. Krogman.

WORCESTER, MASS.—The Heald Machine Co. will build a brick, 1-story, 32 x 80-foot addition to its plant.

WORCESTER, MASS. — The Graton & Knight Mfg. Co. has let the contract for a reinforced concrete, 3-story, 126 x 171-foot building for the storage of raw material, to cost $42,000.

PROVIDENCE, R. I. — The Universal Winding Co. has let the contract for a brick, mill construction, 1-story, 20 x 198-foot storage building.

PROVIDENCE, R. I. — The American Emery Wheel Works has let the contract for a brick, mill construction, 1-story, 40 x 75-foot addition to its plant at 325 Waterman street.

WOONSOCKET, R. I. — The Rosemont Dyeing Co. has let the contract for a brick, 1-story, 50 x 182-foot storage building to cost $19,500 on East School street.

Along the Middle Atlantic Seaboard

DOVER, DEL.—The Midcontinent Irons Co. recently was chartered with $2,000,000 capital to buy, sell and deal in iron and kindred products. M. L. Horty, K. E. Longfield and J. D. Frock, Wilmington, are the incorporators.

GEORGETOWN, DEL. — The National Tractor Co. has been incorporated with $2,500,000 capital to manufacture tractors and tractor parts by W. Martin, C. W. Cullen and A. Worth.

BALTIMORE.—Henry A. Smith & Sons, Inc., plans the erection of a shipbuilding plant.

BALTIMORE. — General contract for a $15,000, 46 x 90-foot foundry has been awarded Price Concrete Construction Co. by the Maryland Brass & Metal Works.

DORSEY, MD.—The Howard Refractories Co. will take bids about Aug. 6 for a 1-story building, to cost about $20,000.

ATLANTIC CITY, N. J.—Atlantic City Steamship & Terminal Co. has been incorporated with $300,000 to build shipyards and construct buildings by C. H. Jeffries, L. D. Algar and G. S. Brooks, Atlantic City.

CALDWELL, N. J.—The county engineer has let a contract to the William G. Sharwell Co., Newark, for $75,000 1-story, 49 x 51-foot, power plant addition.

EAST ORANGE, N. J. — The American Mine & Torpedo Co. has organized with $100,000 capital to manufacture munitions. Gordon Grand, Harry H. Picking and L. Matthews are the incorporators.

BAYONNE, N. J.—The Public Light Service Co., capitalized at $25,000 has been organized to manufacture lamps and fixtures by Louis Lehr, Edward Sweeney and Murray Bell.

NEWARK, N. J.—William Crabb & Co., 305 Third avenue, will build an addition to their plant.

NEWARK, N. J.—The Star Electric Motor Co. has been chartered with $100,000 capital to manufacture electric motors.

BROCKTON, N. Y.—The general contract for a 4-story, 100 x 200-foot factory addition has been let to the Ferro Concrete Construction Co., Cincinnati, by the Paul Delaney Co.

BROOKLYN, N. Y. — Plans are being drawn for a $15,000 power plant extension for the Edison Electric Illuminating Co. M. R. Jahnke, 360 Pearl street, is the architect.

BROOKLYN, N. Y. — The Shipbuilders Iron Works, Inc., has been chartered with $10,000 capital to manufacture iron and steel fittings for boats by A. A. Sawman, C. J. N. Poyer and W. A. Hall, 648 East Tenth street.

BUFFALO.—H. C. Trout, 226 Ohio street, has plans for a 1-story foundry, to be 52 x 83 feet, and a 1-story blacksmith shop to be 40 x 50 feet.

EAST SYRACUSE, N. Y.—The Onondaga Steel Co., Syracuse, N. Y., is having plans drawn for three factory buildings.

DE WITT, N. Y.—Architect Frank D. Chase, Chicago, is drawing preliminary plans for 1-story, 150 x 200-foot factory building, costing $35,000, for the Porter-Cable Machine Co.

FULTON, N. Y.—Plans have been drawn for 2-story, 80 x 350-foot paper mill, costing $150,000, for the Arrowhead Mills, Inc.

FULTON, N. Y.—The Sealright Co. has been chartered with $30,000 capital to manufacture machines, tools, etc. W. L. Wright, E. W. Skinner and J. T. Bond are the incorporators.

NEW YORK.—The Plattsburg Alloys Corp. has been chartered with $6000 capital by W. J. Douglass, R. U. Fitting and E. Klapp, 60 Wall street.

NEW YORK.—The Silent Valve Motors Corp. recently was incorporated in Delaware with $3,500,000 capital. The incorporators are: W. E. Pearson, E. F. Oates and F. L. Russell.

NEW YORK.—The Capital Electric Light Co. has been organized with $15,000 capital to manufacture gas and electric lamps by S. Eisenberg, S. and M. Siegel, 356 Miller avenue.

NEW YORK.—The New York Pyrites Co. has been organized to mine and mill ores. The company is capitalized at $120,000. The incorporators are: W. E. Lowther, T. W. Tannock and L. F. Criado, 41 Broad street.

NEW YORK. — The Runyon Corp. has been incorporated with $25,000 capital to engage in a foundry and machine shop business by A. W. Britton, S. B. Howard and G. V. Reilly, 65 Cedar street.

NEW YORK.—The Miller Morris Corp., capitalized at $52,500, has been organized to manufacture auto carburetors and accessories. G. Miller, T. A. Morris and H. C. Harris, 51 Chambers street, are the incorporators.

NEW YORK.—The Federal Ship Building Co. has been incorporated in New Jersey with $3,000,000 capital. Construction of a $6,000,000, 10-way plant soon will be started at Hackensack, N. J. Incorporators are W. W. Corlett, Kenneth B. Halsted and Edward F. Briggs.

NEW YORK. — The Foreign Crucibles Corp. has been incorporated in Delaware with $250,000 capital to manufacture crucibles of all kinds. The incorporators are: George H. Ames, M. E. Healy and Louis Rebele.

NEW YORK.—Longuemare Motor Devices Co., capitalized at $25,000, has been organized for the purpose of manufacturing carburetors, motors, machinery and equipment by B. Happ, P. D. Saxe and I. Mosson, 3 Broome street.

NEW YORK. — The Grant Mamod Mfg. Co. has been chartered with $2,500,000 capital in Delaware to manufacture pistols and machine guns of all kinds. The incorporators are: A. W. Britton, S. B. Howard and Louis H. Gunther.

NEW YORK.—The Imperial Machine & Foundry Co. has been incorporated with $300,000 capital to engage in the manufacture of machinery and mill supplies. The incorporators are: H. Robinson, J. C. Abrahmson and R. A. Abrahmson, 30 Church street.

OGDENSBURG, N. Y.—The St. Lawrence Metal Products Corp. has been organized with $200,000 capital by E. J. Turley, P. H. Fitzgibbons and J. E. Fell.

ALLENPORT, PA.—The Pittsburgh Steel Products Co. has awarded the general contract to E. M. Winehert Co. of Pittsburgh, for a $50,000 pumping station and intake.

CHESTER, PA.—The Chester Paper Co., Philadelphia, is taking bids on finishing building, 3-stories high, and 118 x 356 feet in size, to cost $200,000.

HAZLETON, PA.—The Worthington Pump & Machinery Co. has just awarded to John G. Brown, Philadelphia, contract for erecting proposed machine shop, 50 x 100 feet, at the Jeanesville Iron Works plant here, where a big shell order for the United States government is about to be started.

PALMERTON, PA. — Donn & Downing, Washington, architects, will take bids soon for the erection of a $200,000, 3-story laboratory here for the New Jersey Zinc Co.

PHILADELPHIA. — George D. Wetherill & Co. are ready for bids on 4-story, 37 x 87-foot building with a 16 x 30-foot wing.

PHILADELPHIA.—H. W. Castor, architect, has awarded contracts for a 5-story machine shop for the Autocar Co., Ardmore.

PHILADELPHIA.—The Wood Mfg. Co. has awarded a contract for brick, steel and concrete factory building to cost approximately $60,000.

TO USERS OF
THE WHOLE "KEWANEE" FAMILY

ON AUGUST 1ST, 1917
THE KEWANEE PLANT OF THIS COMPANY,
LOCATED AT
KEWANEE, ILLINOIS,
WAS SOLD TO THE
WALWORTH MANUFACTURING COMPANY
AND ON THAT DATE
NATIONAL TUBE COMPANY
RETIRED FROM THE FITTINGS BUSINESS.

NATIONAL TUBE COMPANY

Activities in the Central States

ANDERSON, IND. — The Anderson File Co. has been chartered with $10,000 capital to do a general manufacturing business. The incorporators are: F. M. Wilson, S. R. Wilson and C. E. Wilson.

FT. WAYNE, IND.—The General Electric Co. is building two 5-story plants, 75 x 500 feet. A. E. Barnes is superintendent.

PERU, IND. — The Peru Foundry Co. lately was organized with a capital stock of $60,000, to conduct a general foundry business. The incorporators are: M. F. Gartland, J. H. Schaumleffel and Harry J. Schaumleffel.

CHICAGO.—The Binoscope Co. has been incorporated with $50,000 capital by W. L. Bargh and H. C. Biossat.

CHICAGO.—The Chicago Fuse Mfg. Co., 1014 West Congress street, is having plans prepared for a 119 x 125-foot factory.

CHICAGO.—The Union Drop Forge Co., 1746 Kostner avenue, has been granted a permit to build a 50 x 100-foot power house to cost $15,000.

CHICAGO.—The National Carbon Co. has purchased a site on South Ashland avenue, on which it plans to erect a 4-story, 100 x 160-foot manufacturing building.

CHICAGO. — The Windermere Hotel, Charles D. Moore, manager, 1624 East Fifty-sixth street, will build a 12-story, 600-room annex, to cost $2,250,000.

CHICAGO.—Architect S. M. Crowen, 30 North La Salle street, is receiving bids on a 1-story, mill construction factory for the Elgin Motor Car Co. at Argo, Ill.

CHICAGO. — The Baldwin Shipping Co., 327 South La Salle street, has awarded a contract to the Chicago Building Construction Co., 4770 Lincoln avenue, for a 1-story, 42 x 294-foot warehouse to cost $35,000.

CHICAGO.—The Vaughan & Bushnell Mfg. Co. has awarded a contract to the Stoddard Construction Co., 343 South Dearborn street for a 2-story, 62 x 92-foot reinforced concrete warehouse to cost $20,000.

CHICAGO.—The Western Express Co. is planning to erect a building on a 101 x 160-foot site on Tilden avenue. The building is expected to cost $300,000 and will probably be used for a warehouse.

CHICAGO.—W. L. De Wolf & Co., 110 South Dearborn street, has been granted a permit to erect a 6-story, 65 x 238-foot manufacturing building to cost $200,000. The William Adams Co., 209 South La Salle street, has the contract.

CHICAGO.—The Hurley Machine Co., 29 South Clinton street, has let a contract to E. L. Archibald & Co., 111 West Washington street, for a 3-story office building, 59 x 98 feet, a 1-story shop, 98 x 416 feet, and a 2-story foundry, 112 x 200 feet.

CHICAGO. — Architects Dibelka, Flaks & Minchin, 130 North Fifth avenue, will have plans prepared by Aug. 6 for a 3-story, 51 x 112-foot reinforced concrete factory for the Vail Rubber Co., 142 West Twenty-seventh street. The building will cost about $30,000.

CHICAGO.—The Peoples Gas, Light & Coke Co., 122 South Michigan avenue, is having plans prepared by its engineer for a gas works to have a capacity of 50,000,000 cubic feet of gas and 1,000,000 tons of coke yearly. The total cost of the work which will extend over a period of from three to five years, will be $15,000,000.

EAST PEORIA, ILL. — The Holt Mfg. Co. will build a 1-story foundry 140 x 300 feet to cost $100,000. Postle & Fischer, 140 South Dearborn street, Chicago, are architects.

FREEPORT, ILL.—The Freeport Machine Works will build a 1-story machine shop costing $15,000. U. M. Dustman, 352 South avenue, is the architect.

PALMYRA, ILL. — The Palmyra Light Heat & Power Co., capitalized at $10,000 has been incorporated by Lewis M. King, Clarence W. King and N. G. King.

PEORIA, ILL.—Work soon will commence on the plant of the Peoria Malleable Castings Co. Hewett & Emerson are the architects.

ROBINSON, ILL.—The Bradford Supply Co. is taking bids on a machine shop, 40 x 50 feet, to cost about $6000. G. H. Kennerly is the architect.

ROBINSON, ILL.—The Bradford Supply Co. will erect two machine shop buildings, 40 x 50 feet each. George H. Kennerly, Benoist building, St. Louis, is architect.

SERGENT, KY. — The Whitley-Elkhorn Coal Co. is to purchase additional equipment inclusive of a 100-kilowatt generator.

SOMERSET, KY.—The Southern Machine Exchange is in the market for a 50-horsepower oil or kerosene engine and a 50-horsepower alternating current, 220-volt motor.

DETROIT.—The Cape Pattern Works & Foundry Co. will build a 1-story factory at 111 Wight street, costing $32,000.

DETROIT. — The department of public works is planning to build a steel and concrete bridge at Vermont street. J. R. Henry is city engineer.

DETROIT. — The Bolles Iron & Wire Works, 288 East Milwaukee avenue, is building an addition to its foundry and boiler room to cost $6000. A. Mansfield is manager.

DETROIT.—The Diamond Power Specialty Co. will build a 2-story factory 112 x 128 feet, costing $70,000. R. Herman, 82 First street, is president.

DETROIT.—The Aluminum Castings Co. has completed arrangements for the erection of a machine shop 106 x 400 feet, to cost $400,000.

DETROIT. — The Hydraulic Oil Systems Corp., capitalized at $180,000, has been chartered by Claude S. Briggs, E. D. Moessner, George B. Yerkes et al.

DETROIT. — The All Power Truck Co., capitalized at $100,000, has been chartered to manufacture motor vehicles by S. V. Dusseau, M. G. Dusseau and J. P. Lavigne.

DETROIT. — The Chalkis Mannufacturing Co. has been chartered to manufacture munitions and implements of war with an authorized capital of $50,000. The incorporators are Alfred G. Hansen, W. P. Kiser and D. H. Peoples.

GLADSTONE, MICH. — The Marble-Card Electrical Co. has been organized by J. F. Card, Three Rivers, Mich., and local interests connected with the Marble Arms Co. A $75,000 plant will be erected in Gladstone for the manufacture of electrical devices.

GRAND RAPIDS, MICH. — The Electric Service and Power Equipment Co., capitalized at $11,000, has been chartered to manufacture motors and machinery by William G. Brummeler, J. Brown and D. R. McDuffe.

ISHPEMING, MICH.—Bids will be taken at once by the Cleveland Cliffs Iron Co., through Architect M. J. Sturm, 116 South Michigan street, Chicago, for the erection and equipment of a $100,000 hospital and infirmary building, 55 x 143 feet, three stories high, to be built in Ishpeming.

LANSING, MICH. — The Olds Motor Works has let the contract for a 80 x 400-foot factory building.

PORT HURON, MICH.—The Grand Trunk railway is building an additional freight car repair shed 150 x 360 feet.

ST. JOHNS, MICH.—Plans are being completed for the erection of a factory for the Triangle Motor Truck Co. Specifications call for a building 70 x 236 feet. Other buildings will be erected as soon as business warrants. The contracts will be let this week.

ALLIANCE, O.—The Alliance Armature & Motor Repair Co. has been incorporated with $10,000 capital by William G. Richards, Henry R. Kline, Fred Ost, Kaspar Matthias and F. M. Matthias.

CLEVELAND.—The Federal Nut Bolt & Machine Co. has purchased a site and plans to erect a factory building.

CLEVELAND. — H. E. Hedges, Plain Dealer building, is having plans prepared for a $75,000 apartment house.

CLEVELAND. — Architect Franz Warner is preparing plans for a 2-story, $110,000 mercantile building to be built for E. W. Farr.

CLEVELAND.—The Guide Motor Lamp Co. has purchased a 5½-acre site on Mandalay avenue and is having plans drawn for a new plant.

CLEVELAND.—The Union Tool Co. has been incorporated with $100,000 capital by S. L. Drake, G. I. Gardner, A. E. Gillard, E. S. Byers and Edward W. Dissette.

CLEVELAND.—The Triumph Machine Tool Co. has been incorporated with $15,000 capital by T. F. Rainsford, S. R. House, H. C. Robblee, Louis Englander and M. Taraba.

CLEVELAND. — The Morgan Lithograph Co. is having plans prepared for a 3-story, 138 x 250-foot building, to be built at estimated cost of about $150,000.

CLEVELAND.—The Quinnisec Iron Mining Co., which is affiliated with the Corrigan-McKinney Co. has taken title to 64 feet of frontage near the furnace district.

CLEVELAND.—The Lang Auto Body Co., Charles E. J. Lang, president, has purchased a 5-acre site and will build a $100,000 factory. Plans are being prepared by Charles Schmitt.

CLEVELAND.—Harry D. Koblitz, 379 the Arcade, has purchased a 181 x 883-foot parcel, upon which four 6-story buildings are to be erected. The estimated cost of the buildings is $500,000.

CINCINNATI.—The Sayers & Scovill Co. has purchased a site for a consideration said to be about $100,000 and will erect an automobile factory.

CINCINNATI.—Architect B .L. Baldwin has completed plans for a 3-story, 50 x 100-foot factory building for the National Lead

Co. The cost of the proposed building is estimated at $60,000.

DAYTON, O.—The Superior Tool Co. has been incorporated with $10,000 capital to manufacture tools and special machinery. The incorporators are: William E. Watson, M. B. Watson, H. W. Williams, M. B. Williams and H. Orrin Jones.

MANSFIELD, O.—The Kenney McGreevy Foundry Co. has been incorporated with $20,000 capital. The incorporators are: W. D. Kenney, Hugh McGreevy, Joseph W. Paule, Andrew Kass and Jacob Cousins.

MUSKEGON, MICH. — The Enterprise Brass Works is building an addition to cost $20,000. F. Holt is manager.

PONTIAC, MICH.—The Michigan Drop Forge Co. will increase its capital and build additions. B. T. Enger is president.

TOLEDO, O.—The Teens Run Coal Co., capitalized at $100,000, has been organized by A. H. Miller, C. H. Brady, L. C. Filbright, E. M. Wherle and M. C. Seely.

TOLEDO, O.—The Jaxon Co. recently was incorporated with $10,000 capital to manufacture tools and dies. The incorporators are: Frederick E. LaFrance, G. E. Smith, Frank L. Lucas, George I. Michener and Frank H. Geer.

YOUNGSTOWN, O.—The Lau Iron Works Co. recently was incorporated with $350,000 capital by A. W. Lau, E. E. Swartzweller, John R. Rowland, John T. Harrington and H. E. Grosshans.

EAU CLAIRE, WIS.—Articles of incorporation have been filed by the New May Machinery Co., Eau Claire. The capital stock is $25,000 and the incorporators include Ernest Wege, O. A. King and A. J. Hintz.

MERRILLAN, WIS.—A new concrete dam and power house for the municipal electric light and power plant will be constructed on the Wisconsin river under the direction of William True, Hatfield, Wis., consulting engineer. The work will cost about $25,000.

MILWAUKEE.—Articles of incorporation have been filed by the Wasson Trolley & Mfg. Co., Milwaukee. The capital stock is $50,000 and the incorporators are Frank A. Wasson, Douglas R. Moore and Charles L. Pfeiffer.

MILWAUKEE.—The Link Belt Co., Indianapolis, has engaged the Thomas S. Watson Co., Majestic building, Milwaukee, to prepare specifications and award contracts for a lighting system for its Chicago plant at Thirty-ninth and Stewart avenues.

MILWAUKEE.—The Northwestern Bridge & Iron Co., 127 South Water street, has taken the general contract for the erection of a steel and brick shop addition for the Fitzsimmons Steel Products Co., 530 Park street, Milwaukee. The structure will be 75 x 150 feet in size and one story high.

MILWAUKEE, WIS.—Bids soon will be taken for the construction and equipment of a power plant for the new sewage disposal plant which will cost $15,000,000 complete. The power plant and installation is estimated to cost $750,000 to $900,000. Specifications now are being prepared under the direction of T. Chalkley Hatton, chief engineer. George H. Benzenberg is a member of the commission.

MILWAUKEE.—Kirchoff & Rose, architects, Majestic building, are preparing plans for a proposed 10-story business block, about 120 x 240 feet, to be erected on the northeast corner of Grand avenue and Second street, Milwaukee, by a syndicate headed by Otto Streissguth, 1215 Majestic building. The estimated cost is $750,000.

STEVENS POINT, WIS.—L. A. DeGuere, consulting engineer, Grand Rapids, Wis., has plans in progress for the proposed new $150,000 hydroelectric plant to be established on the Wisconsin river near Stevens Point by the Jackson Milling Co., owned by the Mead and Witter interests of Grand Rapids.

SUPERIOR, WIS. — A tract 350 feet long, at Dock street and Hughitt slip, has been transferred to the Itasca Elevator Co. for $38,500. The site will be used for the erection of a new grain elevator, with a capacity of 3,000,000 bushels, according to rumors current here.

RACINE, WIS.—The Belle City Mfg. Co., agricultural tools, has awarded contracts for the erection of a foundry addition and woodworking shop costing $25,000.

RACINE, WIS.—The Racine Rubber Co. has awarded the general contract to the Nelson Co., Racine, for the construction of extensive plant additions, costing about $350,000. They include a new rubber mill, 100 x 650 feet, three stories high with a 3-story wing, 50 x 60 feet, and a power house addition, 50 x 150 feet.

Mississippi to the Rockies

FORT MADISON, IOWA.—The municipal waterworks system will be enlarged by the addition of a pump house building, two 42-inch centrifugal pumps, two 300-horsepower motors, transformers and equipment, and a 10-ton traveling crane. The E. T. Perkins Engineering Co., 1210 First National Bank building, Chicago, is engineer.

PALO, KAS.—Bonds for $30,000 have been voted for an electric light and waterworks plant. G. P. Taylor, Stockton, Kan., is engineer.

DULUTH. — The Duluth Iron Works is building a foundry.

MINNEAPOLIS.—The C. W. Lundquist Co., 1300 Quincy street, will build a plant including a machine shop at a cost of $18,000.

MINNEAPOLIS.—Kenneth W. Robinson is having plans revised by architect D. S. Klafter, 64 West Randolph street, for an 11-story, 126 x 165-foot hotel to cost $800,000. Plans will be completed about Aug. 15.

KANSAS CITY, MO.—The Walls Frogless Switch & Mfg. Co. has leased a factory and will equip it to manufacture railway appliances.

KANSAS CITY, MO. — Montgomery & Ward, St. John & Belmont streets, have let the contract for a 10-story, 108 x 182-foot concrete warehouse to Wells Bros., 23 West Jackson Boulevard, Chicago.

ST. LOUIS.—The Spring Wheel Co. is in the market for equipment including lathes, presses, electric motors, and bolt cutters.

ST. LOUIS. — A. H. Burchard, Pontiac building, is in the market for malleable foundry, and pattern shop equipment.

ST. LOUIS. — The Wielandy-Reller Auto Equipment Co. has been incorporated with $10,000 capital to manufacture automobile accessories. Paul J. Wielandy is among the incorporators.

ST. LOUIS.—The Auto Traffic Signal & Mfg. Co., recently was incorporated with $5000 capital to engage in the manufacture of auto parts, tools, machinery, etc. Alfred A. Krause, Walter G. Krause and Arno D. Krause are the incorporators.

LIVINGSTON, MONT. — The Northern Pacific Railroad Co. will build a steel and concrete bridge over Shields River at a cost of $200,000.

DEMING, N. MEX.—The general contract for the $2,500,000 cantonment here has been awarded to J. W. Thompson, Boatmans Bank building, St. Louis.

RED ROCK, OKLA.—Bids will be taken by the board of trustees of Red Rock until Aug. 13 for a waterworks system; to include a triplex pump, 25 horsepower oil engine and a 30,000-gallon tank on a 115-foot tower. Clyde Cady is town clerk.

SHAWNEE, OKLA.—The Monroe Power Screw Co., recently incorporated, will buy motor-driven equipment. L. C. Webster, Box 12, is purchasing agent.

BEAUMONT, TEX.—The Texas Saw Works has been chartered with $10,000 capital by W. T. Chenault, N. J. Kavanaugh and E. E. Emmett, Conroe.

OMAHA, NEBR.—E. G. Wolfe has organized the Nebraska Tire & Rubber Co. with $500,000 capital.

OMAHA, NEBR.—The Chicago Standard Metallic Packing Co. has been incorporated with $27,000 by John Baveker and others.

MACKAY, IDAHO.—The Empire Copper Co. has awarded a contract for an aerial tramway 16,300 feet long to the American Steel & Wire Co. at $80,000.

WALLACE, IDAHO.—The stockholders of the Northern Light Mining & Milling Co. will erect a 150-ton concentrating plant at Pine Creek.

New Catalogs

EXPANSION JOINTS.—The Ross Heater & Mfg. Co., Buffalo, recently issued a folder devoted to a description of crosshead-guided expansion joints for use in superheated, saturated or exhaust steam lines. These joints are used in high and low pressure, and high and low temperature lines carrying oil, gas or water. They are claimed to be sensitive to every slight variation in pipe line length instead of requiring a heavy pressure for operation.

FOUNDRY AND STEEL WORKS EQUIPMENT.—A 60-page catalog, issued by the Biehl Iron Works, Inc., Reading, Pa., illustrates and describes the extensive line of coal and ore trucks and buckets of various types manufactured by this company. Many types of industrial cars are also presented, as well as skip hoists for blast furnace work. For foundry work, a large core oven car is illustrated, flat top trucks, charging barrows, etc.

BORONIC METAL ALLOYS.—A 16-page pamphlet, describing boronic copper and boronic metal alloys, has been issued by the American Boron Products Co., Inc., Reading, Pa. These boronic products are deoxidizers for non-ferrous and ferrous metals. Boronic copper consists of electrolytic copper impregnated with boronic gases, occluded by the copper. The copper, thus treated, becomes a flux, and when the gas of boronic copper is liberated in the remelt, it serves the purpose of deoxidizing, cleansing, solidifying and alloying. It is claimed that the gases in their efforts to cleanse the metals from oxides, cause a stirring or mixing of the entire metallic mass, creating a molecular migration, and thereby effecting a homogeneous and uniform alloy or mixture.

Iron and Steel Prices

Corrected to Tuesday noon

IRON ORE

Superior Ores, Per Ton, Lower Lake Ports.
Old range Bessemer, 55 iron..... 5.95
Mesabi Bessemer, 55 iron..... 5.70
Old range non-Bess., 51½ iron..... 5.20
Mesabi non-Bess., 51½ iron..... 5.05
Port Henry Ores, non-Bessemer, Per Unit,

Delivered Eastern Pennsylvania.
Old Bed, crude 55 iron..... 10.50c to 11.00c
Old Bed., concent., 65 iron 11.00c to 11.50c
Harmony, concent., 63 iron 11.50c to 11.75c
Lump (at mines)..... $5.75

WAREHOUSE PRICES

Steel bars, Chicago.....	4.50c
Steel bars, Cleveland.....	**5.00c**
Steel bars, Detroit.....	4.50c
Steel bars, Philadelphia.....	5.00c to 5.50c
Steel bars, New York.....	4.75c to 5.00c
Steel bars, St. Louis.....	4.55c
Steel bars, Cincinnati.....	**5.00c**
Steel bars, St. Paul.....	4.60c
Steel bars, Buffalo.....	4.60c to 5.10c
Iron bars, Chicago.....	4.50c
Iron bars, Cleveland.....	**4.95c**
Iron bars, Detroit.....	4.50c
Iron bars, St. Louis.....	4.45c
Iron bars, Cincinnati.....	**5.00c**
Iron bars, Philadelphia.....	5.00c
Iron bars, New York.....	5.00c
Shapes, Chicago	5.00c
Shapes, Detroit	5.00c
Shapes, St. Louis.....	5.05c
Shapes, St. Paul.....	5.10c
Shapes, New York.....	5.00c to 5.25c
Shapes, Cleveland	**5.25c**
Shapes, Philadelphia	5.00c to 5.50c
Shapes, Buffalo	5.10c to 5.35c
Shapes, Cincinnati.....	**5.25c**
Plates, Chicago	7.00c to 8.00c
Plates, Detroit.....	**9.00c to 10.00c**
Plates, St. Louis.....	7.05c to 7.55c
Plates, St. Paul	**7.10c**
Plates, New York.....	8.00c to 9.00c
Plates, Cleveland	7.50c
Plates, Philadelphia	9.50c to 10.00c
Plates, Cincinnati.....	**9.50c**
No. 10 blue anl. sheets, Chi.	9.50c to 10.00c
No. 10 blue anl. sheets, Cleve.	9.50c
No. 10 blue anl., Buffalo...	11.00c to 11.75c
No. 10 blue anl., sheets, St. L.	10.05c
No. 10 blue anl. sheets, Cinci.	9.50c
No. 10 blue anl. sheets, St. Paul	9.60c
No. 28 black sheets, Chgo...	9.50c to 10.00c
No. 28 black sheets, Chicago	9.50c
No. 28 black sheets, Cleve..	9.50c
No. 28 black sheets, Cincin.	8.65c
No. 28 black, Detroit.....	**9.50c**
No. 28 black sheets, St. L..	10.35c
No. 28 black sheets, St. Paul	9.60c
No. 28 galv. sheets, Chgo..	11.00c to 11.50c
No. 28 galv. sheets, Cleve..	11.00c
No. 28 galv. sheets, Cincin..	10.65c
No. 28 galvanized, Detroit...	11.00c
No. 28 galv. sheets, St. L..	11.75c
Hoops, Cleveland	6.00c
Hoops, Detroit.....	**7.00c**

IRON AND STEEL SCRAP

STEEL WORKS USE

(Gross Tons)

Bundled sheets, Pittsburgh..	$25.00 to 27.00
Bundled sheets, Cleveland...	27.00 to 28.00
Bundled sheets, Buffalo.....	21.00 to 21.50
City wrought, short, N. Y..	27.00 to 28.00
Frogs, switches, guards, St. L.	35.00 to 35.50
Heavy melting steel, Pitts...	33.00 to 35.00
Heavy melting steel, Buffalo	33.00 to 34.00
Heavy melting steel, Chgo...	33.00 to 34.00
Heavy melt'g steel, Cleveland.	32.00 to 33.00
Heavy melting steel, Cinci..	31.00 to 31.50
Heavy melting steel, east. Pa.	31.00 to 32.00
Heavy melting steel, N. Y..	27.00 to 28.00
Heavy melting steel, St. L..	35.50 to 36.00
Heavy melt'g steel, Birming.	**21.00 to 22.00**
Hydraulic pressed sh'ts, Cleve.	28.00 to 29.00
Hydraulic press. sheets, Pitts.	31.00 to 32.00
Hydraulic pressed sh'ts, Chgo.	24.00 to 24.50
Low phos. steel, Buffalo....	45.00 to 48.00
Low phos. steel, Pittsburgh.	40.00 to 45.00
Low phos. steel, eastern Pa.	56.00 to 58.00
Shoveling steel, Chicago....	30.00 to 31.00
Shoveling steel, St. Louis....	29.00 to 30.00
Steel rails, short, Chicago...	40.00 to 41.00
Steel rails, short, Cleveland..	38.00 to 39.00
Steel rails, short, St. Louis.	39.00 to 40.00
Steel rails, old, Birmingham..	**27.00 to 28.00**
Stove plate, Cincinnati.....	17.00 to 17.50
Stove plate, St. Louis.....	36.00 to 37.00
Stove plate, N. J. points....	21.00 to 21.50
Stove plate, Birmingham....	17.00 to 18.00
Stove plate, Buffalo.....	20.00 to 21.00
Stove plate, eastern Pa.....	21.00 to 22.00
Stove plate, Pittsburgh.....	23.00 to 23.50

(Net Tons)

Boiler plate, cut, No. 1, Chgo.	$20.00 to 21.00
Boiler plate, cut, No. 1, St. L.	19.00 to 19.50
Bundled sheets, Cincinnati...	19.00 to 19.50
Knuckles, coup., Chicago...	41.00 to 42.00
Knuckles, coup., St. Louis..	39.00 to 40.00
Springs, Chicago	42.00 to 43.00
Stove plate, Chicago	19.00 to 20.00
Stove plate, Cleveland.....	21.00 to 22.00

Freight Rates, Pig Iron

Mahoning and Shenango valleys to:	
Cleveland	$0.95
Newark, N. J.....	2.98
Boston	3.18
Philadelphia	2.78
Pittsburgh	.95
St. Louis	3.18
Minneapolis, St. Paul.....	4.54
Buffalo to:	
Albany, N. Y.....	$1.26
New England (rail).....	2.58
New York and Brooklyn (rail)..	2.58
Virginia furnaces to:	
Boston docks (r. and w.).....	$3.05
New England (all rail).....	3.25
New York dock (r. and w.).....	2.88
Birmingham, Ala., to:	
Cincinnati	$2.90
Chicago	4.00
Cleveland	4.00
Louisville, Ky.	2.65
Minneapolis, St. Paul.....	5.85
New York (r. and w.).....	4.25
Philadelphia (r. and w.).....	4.00
Pittsburgh	4.90
Savannah, Ga.	2.75
St. Louis	3.40
Chicago to:	
Des Moines	$2.80
Milwaukee	.50
Minneapolis, St. Paul.....	2.00
Moline, Ill.	1.40
Omaha	3.58
St. Louis	1.58
Ironton and Jackson, O., to:	
Chicago	$2.54
Cincinnati	1.26
Cleveland	1.62
Detroit	1.81
Indianapolis	1.58
Minneapolis, St. Paul.....	4.54
Duluth, Minn., to:	
Minneapolis-St. Paul	$1.25
Mayville, Wis.:	
Minneapolis-St. Paul	$1.75

Freight Rates, Finished Material

Pittsburgh, carloads, per 100 lbs., to:	
New York	16.9 cents
Philadelphia	15.9 cents
Boston	18.9 cents
Buffalo	11.6 cents
Baltimore	15.4 cents
Cleveland	10.5 cents
Cincinnati	15.8 cents
Chicago	18.9 cents
Detroit	15.7 cents
Minneapolis and St. Paul..	32.9 cents
Denver	76.1 cents
St. Louis	23.6 cents
New Orleans	30 cents
Birmingham	45 cents
Pacific coast (all rail).....	73.9 cents
Pacific coast (tin plate)....	70 cents
Pacific coast, via Panama..	61.0 cents

IRON MILL USE

(Gross Tons)

Busheling, No. 1, Buffalo...	29.00 to 30.00
Busheling, No. 2, Buffalo...	20.00 to 21.00
Busheling, No. 1, Pittsburgh.	25.00 to 27.00
Cast borings, New York....	18.00 to 18.50
Cast borings, eastern Pa....	21.00 to 22.00
Cast borings, Buffalo.....	20.00 to 21.00
Cast borings, Pittsburgh....	21.00 to 22.00
City wrought, long, New York	36.00
Forge flashings, small, Cleve.	29.50 to 30.00
Forge flashings, large, Cleve.	27.00 to 28.00
Forge, No. 1, eastern Pa...	22.50 to 23.50
Grate bars, Buffalo.....	20.00 to 21.00
Grate bars, N. J. points....	19.00 to 19.50
Iron axles, Pittsburgh.....	50.00 to 52.00
Iron axles, Cincinnati.....	44.00 to 44.50
Iron axles, eastern Pa.....	50.00 to 55.00
Iron axles, Buffalo.....	45.00 to 50.00
Iron rails, Chicago.....	40.50 to 41.50
Iron rails, Buffalo.....	43.00 to 44.00
Iron rails, Cincinnati.....	34.50 to 35.00
Iron rails, St. Louis.....	39.00 to 40.00
Iron rails, Cleveland.....	43.00 to 44.00
Machine turnings, Chgo.....	17.50 to 18.50
Machine turnings, Buffalo...	$18.00 to 19.00
Machine shop turnings, N. Y.	18.00 to 18.50
Mach. shop turnings, Pitts..	20.00 to 21.00
Mch. shop turnings, east. Pa.	19.00
Machine turnings, Birming..	11.00 to 12.00
R. R. mch. cast, No. 1, Buff.	30.00 to 31.00
R. R. wrought, 1, Buffalo...	43.00 to 45.00
R. R. wrgt., No. 1, east. Pa.	43.00 to 47.00
R. R. wrought, No. 1, Pitts.	43.00 to 44.00
R. R. wrought, 1, B'ham...	**30.00 to 31.00**
Wrought pipe, Buffalo.....	**33.00 to 34.00**
Wrought pipe, eastern Pa...	30.00 to 32.00
Wrought pipe, New York...	27.00 to 28.00

(Net Tons)

Angle bars, iron, Chicago...	$38.00 to 39.00
Angle bars, steel, St. Louis.	30.00 to 30.50
Arch bars & transoms, St. L.	40.00 to 41.00
Arch bars & transoms, Chgo.	40.00 to 41.00
Busheling, No. 1, Chicago..	25.00 to 26.00
Busheling, No. 1, Cincinnati	21.50 to 22.00
Busheling, No. 1, Cleveland.	25.00 to 25.50
Busheling, No. 1, St. Louis.	23.50 to 24.00
Busheling, No. 2, Chicago..	21.50 to 22.00
Cast borings, Cincinnati.....	13.50 to 14.00
Cast borings, Cleveland.....	18.00 to 18.50
Cast borings, St. Louis.....	14.50 to 15.00
Cast borings, Chicago.....	**17.00 to 18.00**
Cut forge, Chicago.....	32.00 to 33.00
Grate bars, Cleveland.....	21.50 to 22.50
Iron axles, St. Louis.....	46.00 to 47.00
Iron axles, Chicago.....	**47.00 to 48.00**
Iron axles, Cleveland.....	47.00 to 47.50
Machine shop turnings, Chgo.	17.00 to 18.00
Mach. shop turnings, Cleve..	16.50 to 17.00
Machine shop turn'gs, Cinci.	13.50 to 14.00
Mach. shop turnings, St. L.	15.00 to 15.50
Pipes and flues, Cleveland...	24.00 to 24.50
Pipes and flues, Chicago....	23.00 to 24.00
Pipes and flues, St. Louis..	20.00 to 20.50
Railroad wrought, 1, Cleve..	41.00 to 42.00
Railroad wrgt., No. 1, Chgo.	34.50 to 35.00
Railroad wrought, 1, Cinci..	34.50 to 35.00
Railroad wrought, 1, St. L..	34.00 to 34.50
Railroad wrgt., No. 2, Chgo.	33.00 to 34.00
Railroad wrought, 2, St. L..	31.50 to 32.00

IRON OR STEEL WORKS USE

(Gross Tons)

Axle turnings, Cleveland.....	$26.50 to 27.00
Axle turnings, Buffalo.....	26.00 to 27.00
Shafting, New York.....	41.00
Shafting, eastern Pa.....	45.00 to 47.00
Steel car axles, Birmingham.	33.00 to 35.00
Steel car axles, New York..	54.00
Steel car axles, Buffalo.....	45.00 to 50.00
Steel car axles, Cleveland....	51.00 to 52.00
Steel car axles, Pittsburgh..	50.00 to 52.00
Steel car axles, eastern Pa..	50.00 to 55.00

(Net Tons)

Shafting, St. Louis.....	39.00 to 40.00
Steel car axles, St. Louis...	50.00 to 52.00
Steel car axles, Chicago....	46.00 to 47.00

IRON FOUNDRY USE

(Gross Tons)

Car wheels, (iron), Pitts....	$33.00 to 34.00
Car wheels, (steel), Pitts...	40.00 to 41.00
Car wheels, Chicago.....	30.50 to 32.50
Car wheels, eastern Pa.....	36.00 to 38.00
Car wheels, Buffalo.....	35.00 to 36.00
Car wheels, New York.....	35.00
Car wheels, St. Louis.....	33.50 to 34.00
Car wheels, Birmingham....	24.00 to 24.50
Car wheels, Cleveland.....	31.00 to 32.00
Tram car wheels, Birming...	22.00 to 22.50
Cast, No. 1, Birmingham....	22.00 to 23.00
Cast, 1, machy., N. J. points	38.00
Cast, 1, heavy, N. J. points.	34.00 to 35.00
Cast, No. 1, eastern Pa.....	34.00 to 36.00
Cast, No. 1, Pittsburgh.....	33.00 to 34.00
Malleable railroad, Cincinnati	26.00 to 26.50
Malleable railroad, Cleveland.	31.00 to 32.00
Malleable railroad, Buffalo..	33.00 to 34.00
Malleable railroad, Pittsburgh	31.00 to 33.00
Malleable railroad, east. Pa..	32.00 to 34.00

(Net Tons)

Cast No. 1, Cleveland.....	30.00 to 31.00
Cast, No. 1, Chicago.....	26.00 to 27.00
Cast, No. 1, Cincinnati.....	24.50 to 25.00
Cast, No. 1, St. Louis.....	24.00 to 25.00
Malleable railroad, Chicago..	31.50 to 32.50
Malleable railroad, St. Louis	22.00 to 22.50
Malleable agricultural, Chgo.	25.50 to 26.50

MISCELLANEOUS USES

(Gross Tons)

Reroll. rails, 5 ft. & ov., Pitts.	$45.00
Reroll. rails, 5 ft. & ov., Chgo.	40.50 to 41.50
Reroll. rails, 5 ft. & ov., E. Pa.	43.00 to 45.00
Reroll. rails, 5 ft. & ov., St. L.	42.00 to 43.00
Reroll. rails, 5 ft. or ov., Cleve.	45.00 to 46.00
Rerolling rails, long, Birming.	37.50 to 38.50

(Net Tons)

Boiler punchings, Chicago...	36.50 to 37.50
Locomotive tires, Chicago...	50.00 to 51.00
Locomotive tires, St. Louis..	47.00 to 48.00